Santa Clara Valley
Water District

groundwater
management

2008 Groundwater Quality Report

Santa Clara Valley Water District

Groundwater Management Unit

October 2009

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Executive Summary

The Santa Clara Valley Water District (District) monitors groundwater quality in the Santa Clara, Coyote, and Llagas Subbasins annually in support of District Board Ends Policy 2.1.6: "The groundwater basins are aggressively protected from contamination and the threat of contamination." The primary objectives of this monitoring are to evaluate groundwater quality against established water quality objectives and to provide information to protect the long-term viability of the resource.

This Groundwater Quality Report includes an evaluation of water quality data from 101 wells sampled by the District and 275 wells sampled by water suppliers during calendar year 2008. This includes the following for each subbasin: general evaluation of water quality conditions; comparison of 2008 water quality data to drinking water standards and agricultural objectives; and analysis of water quality trends for nitrate, total dissolved solids, and chloride over the last 10 years. As the Santa Clara and Llagas Subbasins have significant aquitards, data for these subbasins is also analyzed for both the shallow and principal aquifer zones.

The median 2008 concentrations for common inorganic constituents are generally well below California Department of Public Health (CDPH) drinking water standards and Regional Water Quality Control Board agricultural water quality objectives for each subbasin and aquifer zone. Exceptions are nitrate (the median concentration in the Llagas Subbasin shallow zone exceeds the primary, health-based standard) and manganese (the median concentration in the Santa Clara Subbasin shallow zone exceeds the secondary, aesthetic-based standard).

The majority of wells within Santa Clara County produce high-quality water that meets primary drinking water standards. Exceptions for each subbasin are noted below in Table ES-1.

Table ES-1
Wells with Constituents Exceeding Drinking Water Standards (DWS) in 2008

Subbasin and Zone	Primary Health-Based DWS	Notes
Santa Clara Shallow Zone	Arsenic – 2 wells Cadmium – 1 well	Arsenic and cadmium standards were exceeded at monitoring wells.
Santa Clara Principal Zone	Nitrate – 1 well Arsenic – 1 well	The nitrate standard was exceeded at a private domestic well while the arsenic standard was exceeded at a monitoring well.
Coyote Principal Zone	Nitrate – 5 wells	The nitrate standard was exceeded at 5 water supply wells.
Llagas Shallow Zone	Nitrate – 6 wells	All nitrate exceedances occurred at monitoring wells.
Llagas Principal Zone	Nitrate – 16 wells TCE – 1 well Perchlorate – 2 wells	The nitrate exceedances occurred at 5 water supply wells, 8 domestic wells, and 3 monitoring wells. Both the TCE and perchlorate exceedances occurred at supply wells.

Note: For public water supply wells with constituents detected above primary drinking water standards, blending or treatment is required prior to delivery to customers.

Table ES-1 indicates that the following constituents were detected above primary, health-based standards in 2008: nitrate, arsenic, cadmium, perchlorate, and trichloroethylene (TCE). County-wide, the percentage of wells exceeding those primary standards (with the total number of wells analyzed for each constituent) was: nitrate (8% of 346 wells), arsenic (2% of 169 of wells), cadmium (<1% of 169 of wells), perchlorate (<1% of 217 wells) and TCE (<1% of 140 wells). However, as Table ES-1 shows, several exceedances occurred at monitoring wells rather than water supply wells.

The following constituents were detected above secondary, aesthetic-based standards in 2008: Total Dissolved Solids (TDS), electrical conductivity (EC), manganese, iron, aluminum, chloride, sulfate, and zinc. Constituents most frequently detected above secondary standards were TDS (25% of 163 wells), EC (19% of 218 wells), manganese (16% of 168 wells), and iron (8% of 168 wells). It should be noted that the drinking water standards for some constituents, such as TDS, are given as a range by CDPH. For these constituents, the lowest value (recommended limit) was used in this analysis.

Elevated nitrate concentrations are an ongoing groundwater protection challenge in the Coyote and Llagas Subbasins. The District has undertaken various efforts to define the extent and severity of nitrate contamination, identify potential sources, and reduce nitrate loading. The District also continues to monitor progress of the cleanup of the perchlorate plume in the Llagas Subbasin, which has impacted a number of private wells.

Comparison of 2008 data against agricultural objectives in the Regional Water Quality Control Board Basin Plans indicates relatively few exceedances for wells tested in the Santa Clara and Coyote Subbasins. In the Llagas Subbasin, 18% of wells tested for electrical conductivity (EC) exceeded the lowest threshold. However, no wells exceeded the upper limit. District staff will continue to monitor potential changes in EC and other constituents exceeding objectives.

Trend analyses for TDS, chloride, and nitrate were conducted for select wells using ten years of data (1999-2008). County-wide, there were upward trends for approximately 4% of wells tested for TDS, 5% of wells for chloride, and 7% of wells for nitrate. There were downward trends for approximately 2% of wells for TDS, 10% of wells for chloride, and 12% of wells for nitrate. The remaining wells (majority of wells) did not indicate a clear evidence of trends. Trends varied by subbasin and aquifer zone (shallow versus principal zone).

Analysis of 2008 groundwater quality data from monitoring performed by the District and water suppliers indicates that groundwater in Santa Clara County generally meets drinking water standards without additional treatment. The most notable water quality issues continue to be nitrate and perchlorate, primarily in the Llagas Subbasin. However, for the ten years analyzed (1999-2008), nitrate is decreasing in 24% of the principal aquifer zone wells in the Llagas Subbasin (over 70% do not show a trend). The impacts noted in this report present a challenge to water suppliers and private well owners who may need to blend or treat the water prior to delivery or use. However, in general, the three subbasins produce high-quality water and the majority of wells meet drinking water standards without the need for treatment. The District will continue to collect and analyze groundwater quality data to characterize groundwater quality, determine the severity and extent of contamination, and evaluate changes in water quality over time to help ensure the groundwater basins are aggressively protected from contamination and the threat of contamination.

1.0 Introduction

1.1 Background

The Santa Clara Valley Water District (District) monitors groundwater quality as part of its groundwater management activities in support of Board Ends Policy 2.1 – *“There is a reliable supply of healthy, clean drinking water”* and the related Board Ends Policy 2.1.6 – *“The groundwater basins are aggressively protected from contamination and the threat of contamination.”*

The overall objectives of groundwater quality monitoring are to evaluate groundwater quality against established water quality objectives and to provide information to protect the long-term viability of the resource. Specific goals of the groundwater quality monitoring program are to: 1) characterize regional groundwater quality conditions, 2) determine the severity and extent of any contamination, 3) evaluate temporal trends in water quality, and 4) determine where further study or action is warranted to protect groundwater resources.

1.2 Purpose

This 2008 Groundwater Quality Report summarizes the results of groundwater quality monitoring conducted in Santa Clara County (County) during calendar year 2008. This includes results of the District’s own monitoring program data and other monitoring data acquired through the California Department of Public Health (CDPH) water quality database which contains data from water suppliers, including water retailers and mutual water systems. By combining these two data sources, the District can evaluate regional groundwater quality conditions while minimizing costs by avoiding duplication of laboratory analyses and sampling effort.

Using 2008 groundwater quality data collected by the District and water suppliers, this report will evaluate the following:

- General water quality conditions based on mineral characteristics and inorganic constituents
- Groundwater quality as compared to drinking water standards and agricultural objectives
- Water quality trends for select constituents (nitrate, total dissolved solids, and chloride) over the last ten years

1.3 Study Area and Generalized Hydrogeology

Santa Clara County harbors significant groundwater resources beneath its flat valley regions. This resource has been drawn upon since the late nineteenth century and currently provides about half of all water used in the County. Groundwater is pumped from layers of loose sand and gravel that have washed in from adjacent highlands by erosion, which has filled a structural trough in the coastal mountain ranges resulting in a wide, relatively flat valley floor. The valley floor is divided into three main groundwater subbasins – Santa Clara, Coyote, and Llagas. The Santa Clara and Llagas Subbasins are further divided into shallow and deep aquifer zones due to the presence of widespread confining layers consisting of silt and clay. As the vast majority of water used within the County is pumped from the deeper aquifer zone, this zone will be referred to as the principal aquifer zone throughout this report. This report will discuss the quality of groundwater separately for each subbasin and aquifer zone. Figure 1 illustrates the wells sampled by both the District and by water suppliers in 2008.

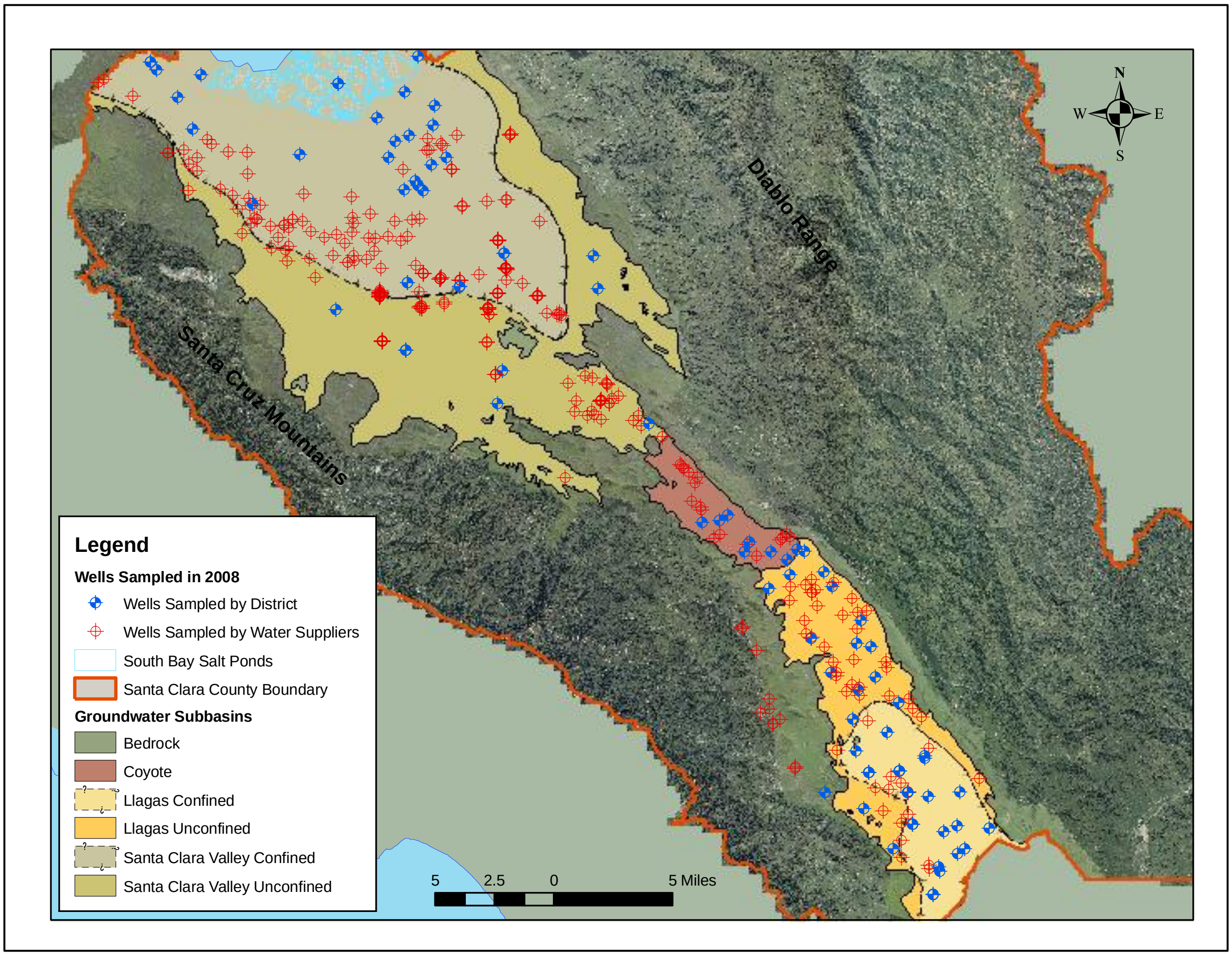

Figure 1. Generalized Location of Wells Monitored in 2008

2.0 Summary of 2008 Groundwater Quality Monitoring

2.1 District Monitoring

The District collected groundwater quality samples from 101 wells in September and October 2008. The wells sampled represent a mix of dedicated monitoring wells and private domestic water supply wells. The parameters analyzed include major and minor inorganic compounds, volatile organic compounds, and other commonly included parameters such as nitrate, total dissolved solids (TDS), and specific conductance (or electrical conductivity [EC]) - see Appendix A for a complete list of parameters. Samples were collected in accordance with widely accepted procedures for groundwater sample collection, filtering, preservation, and handling. The District provided a copy of the laboratory results for each well sampled by the District to the respective well owner.

2.2 Water Supplier Monitoring

Each year, the District acquires data from CDPH which includes the results of monitoring undertaken by the County's water retailers and other water suppliers for compliance with CDPH regulations. For 2008, the CDPH database has data on 275 wells within the County that were sampled and analyzed for a wide range of parameters. In general, these wells are high capacity production wells with multiple screens drawing water from numerous individual aquifer zones. In addition to those parameters analyzed under the District's program, the CDPH data contains information on radionuclides, and semi and non-volatile organics (pesticides) as required by California Title 22 drinking water regulations.

2.3 Summary of Wells Sampled

As described above, available data includes water quality results from wells sampled by the District and by water suppliers for CDPH compliance purposes. A summary of the number of wells sampled in each subbasin is shown below in Table 2-1. It should be noted that not every well is sampled for the same constituents. Although most wells within the District's groundwater quality monitoring network are sampled for all the parameters listed in Appendix A, some wells are only sampled for select constituents of concern such as nitrate or chloride. Water quality data from the CDPH database represents data reported by the water suppliers. As CDPH monitoring frequency varies based on the status of the well and previous results, water quality data for these wells also varies in terms of constituents analyzed.

Table 2-1
Number of Wells Sampled for Each Subbasin

Subbasin	Wells Sampled by District	Wells Sampled by Water Suppliers	Total
Santa Clara	46	195	241
Coyote	7	17	24
Llagas	48	63	111
Total	101	275	376

3.0 Water Quality Results for 2008

The 2008 median concentrations for regulated inorganic constituents in the Santa Clara, Coyote, and Llagas Subbasins are summarized in Table 3-1 below. Detailed discussion of these results is presented in the following sections, which include the evaluation and discussion of 1) general inorganic water quality, 2) groundwater quality in relation to drinking water standards, 3) groundwater quality in relation to agricultural objectives, and 4) groundwater quality trends. The following sections present these results for each subbasin separately.

Table 3-1. Median 2008 Concentrations for Common Inorganic Constituents and Comparison to Water Quality Standards

Constituent	Median Concentration by Subbasin and Zone					Drinking Water Standard[1]		RWQCB Agricultural Objective[2]	
	Santa Clara Shallow	Santa Clara Principal	Coyote	Llagas Shallow	Llagas Principal	Primary MCL	Secondary MCL	SF Bay Region	Central Coast Region
Aluminum (µg/l)	<20	<50	<20	<20	<20	1,000	200	5,000	5,000
Antimony (µg/l)	<2	<6	<2	<2	<2	6	--	--	--
Arsenic (µg/l)	<2	<2	<2	<2	<2	10	--	100	100
Asbestos (MFL)	--	<0.2	--	--	3.2	7	--	--	--
Barium (µg/l)	90.9	130	100	180	74	1,000	--	--	--
Beryllium (µg/l)	--	<1	<1	<1	<1	4	--	100	100
Boron (µg/l)	234	157.5	129.5	133	123	--	--	500	750
Bromide (mg/l)	--	0.15	0.1	0.1	0.1	--	--	--	--
Cadmium (µg/l)	<1	<1	<1	<1	<1	5	--	10	10
Chloride (mg/l)	73	45	36	46	36	--	250	142	142
Chromium, total (µg/l)	<10	<10	<10	<10	<10	50	--	100	100
Copper (µg/l)	<10	<20	<10	<10	<10	1,300[3]	1,000[3]	200	200
Cyanide (µg/l)	--	<100	<100	--	<100	150	--	--	--
EC (µS/cm)	1,357	640	620	857	620	--	900	--	750
Fluoride (mg/l)	0.1	0.1	0.1	0.1	0.1	2	--	1	1
Iron (µg/l)	<20	<100	17	<20	<20	--	300	5,000	5,000
Lead (µg/l)	<5	<5	<5	<5	<5	15[3]	--	5,000	5,000
Manganese (µg/l)	142.9	<20	<50	<50	<50	--	50	200	200
Mercury (µg/l)	<1	<1	<1	<1	<1	2	--	--	--
Nickel (µg/l)	<5	<10	<5	<5	<5	100	--	200	200
Nitrate as NO_3 (mg/l)	1.1	14.2	22	56.2	23.75	45	--	--	--
Nitrate+Nitrite as N (mg/l)	--	3	5.1	--	2.7	10	--	5	--
Nitrite as N (mg/l)	--	<0.4	<0.4	--	<0.4	1	--	--	--
Perchlorate (µg/l)	<4	<4	<4	<4	<4	6	--	--	--
SAR	1.58	0.81	0.76	0.8	0.75	--	--	3	6
Selenium (µg/l)	<5	<5	<5	<5	<5	50	--	--	20
Silver (µg/l)	<5	<10	<5	<5	<5	--	100	--	--
Sulfate (mg/l)	92	43.6	50.1	60.6	32.25	--	250	--	--
TDS (mg/l)	760	390	388	560	382	--	500	--	--
Thallium (µg/l)	--	<1	<1	<1	<1	2	--	--	--
Zinc (µg/l)	<50	<50	<50	<50	<50	--	5,000	2,000	2,000

NOTES: 1) MCL= Maximum Contaminant Level specified in Title 22 of the California Code of Regulations, for constituents with MCL specified as a range, the lowest limit is used. 2) Lowest agricultural objectives specified in San Francisco Bay and Central Coast Regional Water Quality Control Board Basin Plans. 3) Regulated under the Lead and Copper Rule - the 90th percentile of data should not exceed the stated Action Level. Abbreviations: mg/l = milligrams per liter; µg/l = micrograms per liter; EC: Electrical Conductivity (µS/cm = microSiemens per centimeter); SAR=Sodium Adsorption Ratio

3.1 Santa Clara Subbasin

Data for the Santa Clara Subbasin are categorized and discussed separately according to the depth zone that they represent. Data from wells that are 100 feet in depth or less are grouped into the "shallow aquifer zone" category and data from wells greater than 150 feet in depth are grouped in the "principal aquifer zone" category. The basis of this distinction is a preponderance of silt and clay that occurs between about 100 and 150 feet below ground surface within the confined portions of the subbasin constituting a regional aquitard. Water delivered for municipal supply is predominantly drawn from the principal aquifer zone. It should be noted that the concept of shallow and principal aquifer zones is not strictly applicable in unconfined or recharge areas, which lack extensive low-permeability units. However, the general categorization is still worthwhile in that it allows for the separate evaluation of water quality from very shallow zones and from the deeper zones that are more commonly drawn upon for beneficial use.

3.1.1 General Water Quality

The majority of groundwater produced from both the shallow and principal aquifer zones of the Santa Clara Subbasin is generally of calcium magnesium – bicarbonate character with some exceptions. The exceptions represent water that has been altered, potentially due to saltwater intrusion, minimal or no mixing of infiltrating surface water in very deep zones, or changes in the subsurface due to geochemical processes such as ion exchange.

2008 data indicates that the principal aquifer zone has a median TDS content of 390 milligrams per liter (mg/l) with a standard deviation of 222 mg/l for 110 samples. On the basis of dissolved solids, other regulated inorganic constituents, and mineral character, groundwater from the Santa Clara Subbasin generally meets drinking water standards without additional treatment.

3.1.2 Comparison of 2008 Data to Drinking Water Standards

For all regulated constituents with known health risks, CDPH has established a primary drinking water standard or Maximum Contaminant Level (MCL), which is the highest level of a contaminant allowed in drinking water. Secondary Maximum Contaminant Levels (SMCLs) address aesthetic issues related to taste, odor, or appearance of the water and are not related to health effects. Table 3-2 below provides a summary of constituents detected above their respective water quality standards in 2008. It should be noted that wells were also sampled for other constituents, which are not listed in Table 3-2 (and similar tables for other subbasins) because no drinking water standard was exceeded. A summary of all constituents sampled in 2008, including the range of values and number of samples for each subbasin is provided in Appendix B.

Arsenic was detected above the MCL in two shallow aquifer zone monitoring wells. In one of the two wells, cadmium was also detected above the MCL. Both affected wells are shallow monitoring wells less than 100 feet in depth located near the southern shore of the San Francisco Bay, and serve primarily for saltwater intrusion monitoring. Nine water quality constituents were detected above their respective SMCLs in shallow zone wells: aluminum, chloride, iron, manganese, electrical conductivity (EC), sulfate, TDS, turbidity, and zinc. These exceedances are primarily in the region affected by saltwater intrusion. None of the affected wells are utilized for public water supply.

Table 3-2 Constituents Detected Above Drinking Water Standards in 2008 Santa Clara Subbasin

Constituent	Number of Wells Sampled[1]	Number of Wells Exceeding DWS[2]	Concentration in Wells with DWS Exceedances		Drinking Water Standard (DWS)	
			Median	Maximum	Primary MCL	Secondary MCL
Shallow Aquifer Zone						
Arsenic (μg/l)	12	2	20.5	27	10	--
Cadmium (μg/l)	12	1	18	18	5	--
Aluminum (μg/l)	12	1	760	760	1,000	200
Chloride (mg/l)	19	3	700	19,300	--	250
Iron (μg/l)	12	2	35,100	68,000	--	300
Manganese (μg/l)	12	7	793	1,170	--	50
EC (μS/cm)	19	14	1,580	54,400	--	900
Sulfate (mg/l)	12	2	1,369	2,450	--	250
Total Dissolved Solids (mg/l)	12	8	1,000	31,600	--	500
Turbidity (ntu)	12	3	31	230	--	5
Zinc (μg/l)	12	1	9,300	9,300	--	5,000
Principal Aquifer Zone						
Arsenic (μg/l)	110	1	11	11	10	--
Nitrate as NO_3 (mg/l)	207	1	45.8	45.8	45	--
Aluminum (μg/l)	112	3	320	330	1,000	200
Chloride (mg/l)	110	2	816	1,310	--	250
Iron (μg/l)	114	11	550	1,664	--	300
Manganese (μg/l)	114	13	91.7	548	--	50
EC (μS/cm)	113	16	982	4,690	--	900
Total Dissolved Solids (mg/l)	110	23	552	2,460	--	500
Turbidity (ntu)	111	6	9.2	30	--	5

1) Wells were also tested for other constituents, which are not listed in this table if no MCL or SMCL was exceeded. A summary of all constituents sampled and the range of concentrations is provided in Appendix B.
2) Some wells may have more than one constituent exceeding a drinking water standard. For public water supply wells with constituents detected above primary drinking water standards, blending or treatment is required prior to delivery to customers.

In the principal aquifer zone, two constituents were detected above their respective MCLs - nitrate and arsenic. A private domestic well in Almaden Valley (San Jose) had a nitrate concentration of 45.8 mg/l (the MCL is 45 mg/l), and a deep monitoring well in the City of Campbell had an arsenic concentration of 11 μg/l (the MCL is 10 μg/l).

Seven constituents were detected above their respective SMCLs in principal zone wells: aluminum, chloride, iron, manganese, electrical conductivity, TDS, and turbidity. A total of 40 wells, 28 of which are public water supply wells, had at least one constituent detected above its respective SMCL. The four most common constituents detected above SMCLs are total dissolved solids, electrical conductivity, manganese, and iron. Figure 2 (below) illustrates the geographic locations of wells with constituents detected above drinking water standards in 2008.

In the vast majority (99%) of wells tested in the Santa Clara Subbasin, no constituents were detected above primary drinking water standards, indicating excellent water quality in general. No constituents were detected above MCLs in public drinking water supply wells. Aesthetic-based secondary standards were exceeded in up to 23% percent of wells tested. It should be noted that this does not necessarily indicate that the water delivered to consumers had concentrations above secondary water quality standards since mixing and blending occur in the distribution system prior to use.

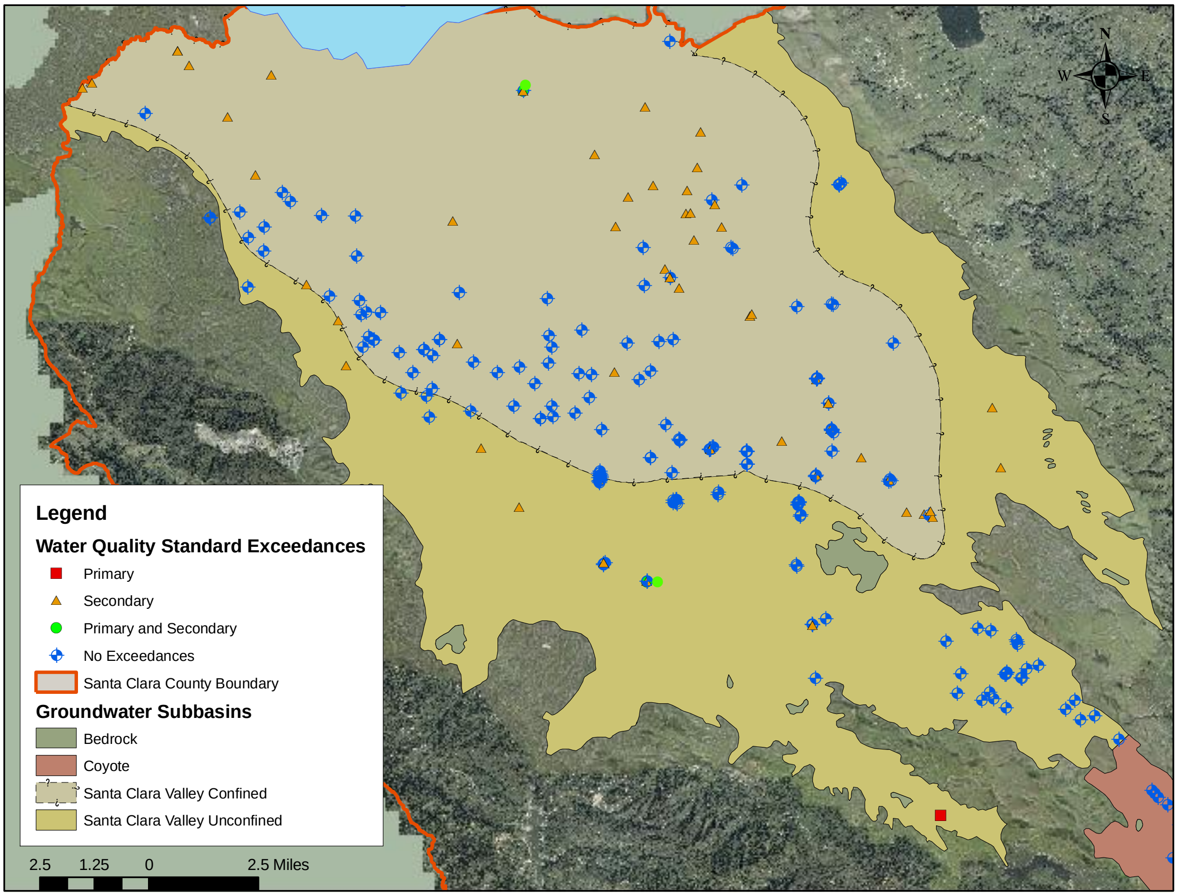
N
W
E
S
Legend
Water Quality Standard Exceedances
Primary
Secondary
Primary and Secondary
No Exceedances
Santa Clara County Boundary
Groundwater Subbasins
Bedrock
Coyote
Santa Clara Valley Confined
Santa Clara Valley Unconfined
2.5
1.25
0
2.5 Miles

Figure 2. Wells with Constituents Detected Above Drinking Water Standards in 2008 Santa Clara Subbasin

3.1.3 Comparison of 2008 Data to Agricultural Objectives

In addition to comparing groundwater quality to drinking water standards, the quality is also compared to standards for agricultural use (irrigation, farming, stock watering, etc) based on the applicable Regional Water Quality Control Board (RWQCB) Basin Plan. This is accomplished by comparing select constituents to the threshold values for agricultural objectives found in Table 3-6 of the San Francisco RWQCB Basin Plan (Basin Plan) updated January 18, 2007.

The median concentrations for constituents with established agricultural objectives are presented in Table 3-1 above. Table 3-1 indicates that the median concentrations for these constituents for both the shallow and principal aquifer zones are below established agricultural objectives. Constituents detected above agricultural objectives are shown in Tables 3-3a and 3-3b below. These tables indicate that although there are some constituents detected above agricultural objectives, the majority of wells tested in the Santa Clara Subbasin meet established agricultural objectives.

Table 3-3a. Constituents Detected Above Agricultural Objectives in 2008
Santa Clara Subbasin - Shallow Aquifer Zone

Constituent	Number of Wells Sampled	Number of Wells Exceeding Agricultural Objective	Concentration in Wells with Agricultural Objective Exceedances		Agricultural Objective[1]
			Median	Maximum	
Boron	12	2	1,123	1,510	500 µg/l
Chloride	19	4	566	19,300	142 mg/l
Cadmium	12	1	18	18	10 µg/l
Iron	12	1	68,000	68,000	5,000 µg/l
Manganese	12	3	361	548	200 µg/l
Sodium Adsorption Ratio	12	4	5.4	55.7	3
Zinc	12	1	9,300	9,300	2,000 µg/l

1) Agricultural objectives shown are threshold values from the San Francisco Regional Water Quality Control Board Basin Plan (Table 3-6).

Table 3-3b. Constituents Detected Above Agricultural Objectives in 2008
Santa Clara Subbasin - Principal Aquifer Zone

Constituent	Number of Wells Sampled	Number of Wells Exceeding Agricultural Objective	Concentration in Wells with Agricultural Objective Exceedances		Agricultural Objective[1]
			Median	Maximum	
Chloride	110	3	322	1,310	142 mg/l
Sodium Adsorption Ratio	109	6	6.7	13.7	3
Boron	26	3	641	3,680	500 µg/l
Manganese	114	3	361	548	200 µg/l

1) Agricultural objectives shown are threshold values from the San Francisco Regional Water Quality Control Board Basin Plan (Table 3-6).

3.1.4 Evaluation of Temporal Trends

Trend analyses were conducted for selected constituents using the Mann-Kendall trend test with a 95% confidence level (p-value equal to or less than 0.05). If the p-value is greater than 0.05, there is not enough evidence to assert a trend. The direction in trend is measured by the Mann-Kendall statistic (or S value), with positive values indicating an upward trend for constituent concentrations through time and negative values indicating a downward trend in concentrations.

Trend analyses were conducted on selected wells in each subbasin for the last ten years (1999-2008). Selected wells include all wells monitored by the District and approximately 25 wells sampled by water retailers, which were chosen to fill in gaps in the spatial distribution. Not all wells with data available for 2008 were tested for trend, primarily due to redundancy of location.

Due to the historical significance and possible impact to groundwater in the County, constituents selected for trend analysis include TDS, nitrate, and chloride. TDS was chosen for trend testing because it is an indicator of salt loading and of overall water quality, nitrate because it affects the largest number of wells in the County, and chloride because of historical saltwater intrusion. The results of trend testing for wells representing each aquifer zone for each constituent are summarized in Table 3-4 below. The number of wells tested for trend for each constituent and each zone varies, and was based on the availability of results for each constituent. A minimum of four results between 1999 and 2008 was required for the well to be included in the trend testing for a given constituent.

Chloride concentrations in the shallow aquifer zone are trending down in nine wells; two wells are showing an upward trend. Most of the wells trending down are located in the region mildly affected by saltwater intrusion indicating that water quality conditions are improving somewhat in the affected area. In the principal aquifer zone, there is one well which shows a statistically significant upward trend for nitrate and another well with an upward TDS trend. The reasons for these increases are unknown at this time but staff will continue to monitor trends in these wells.

Results of trend testing for TDS, chloride and nitrate are illustrated geographically on Figures 3 through 8. Trend testing will continue as more data are developed through subsequent sampling rounds. The early identification of potential adverse trends in water quality is an important component of the District's groundwater protection efforts and assists in the goal of preventing contamination.

Table 3-4. Trend Analyses for the Santa Clara Subbasin (1999-2008)

Constituent	Number of Wells Tested	Wells with no Apparent Trend	Wells with Upward Trend	Wells with Downward Trend
Shallow Aquifer Zone				
Total Dissolved Solids	14	11	2	1
Chloride	22	11	2	9
Nitrate	14	12	2	0
Principal Aquifer Zone				
Total Dissolved Solids	45	43	1	1
Chloride	47	45	0	2
Nitrate	44	41	1	2

1) The number of wells tested for trend for each constituent and each zone varies, and was based on the availability of results for each constituent. A minimum of four results between 1999 and 2008 was required for the well to be included in the trend testing for a given constituent.

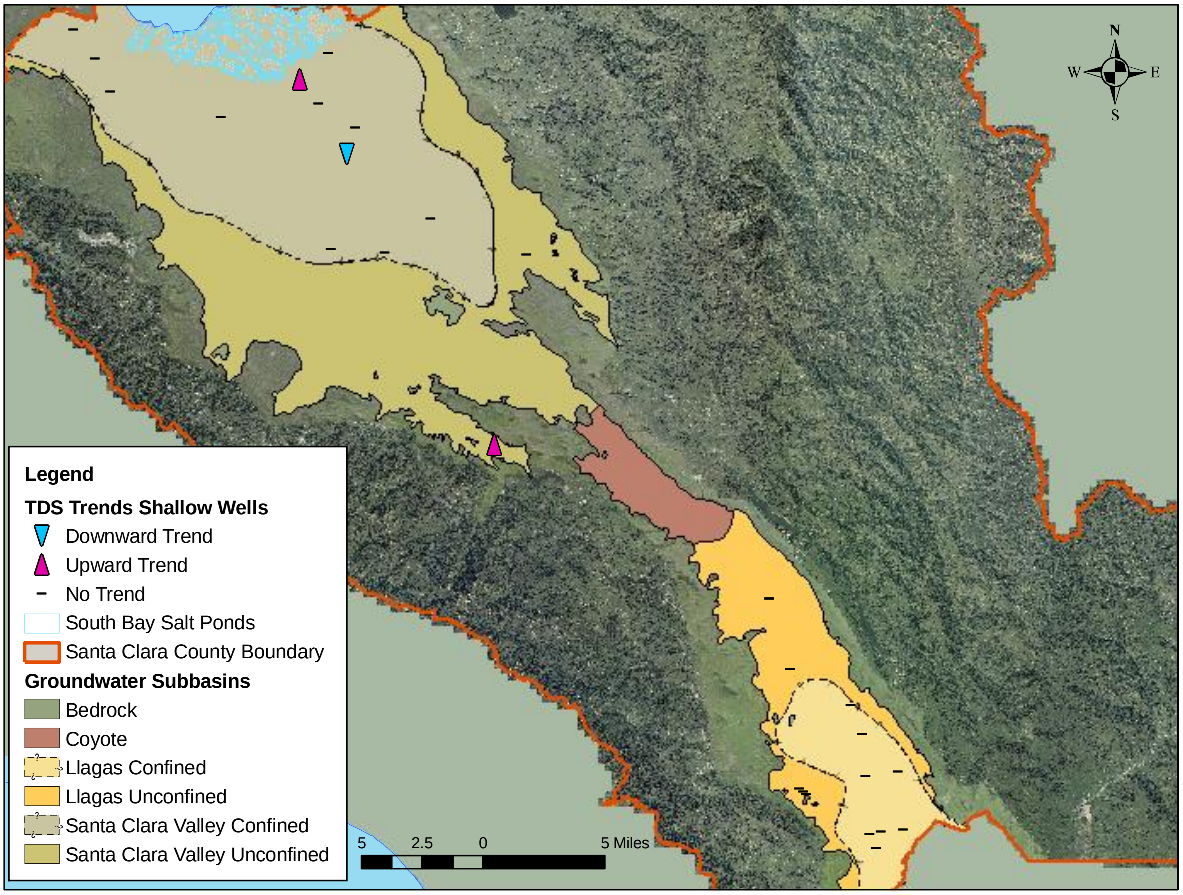

Figure 3. TDS Trends in Select Shallow Wells (1999-2008)

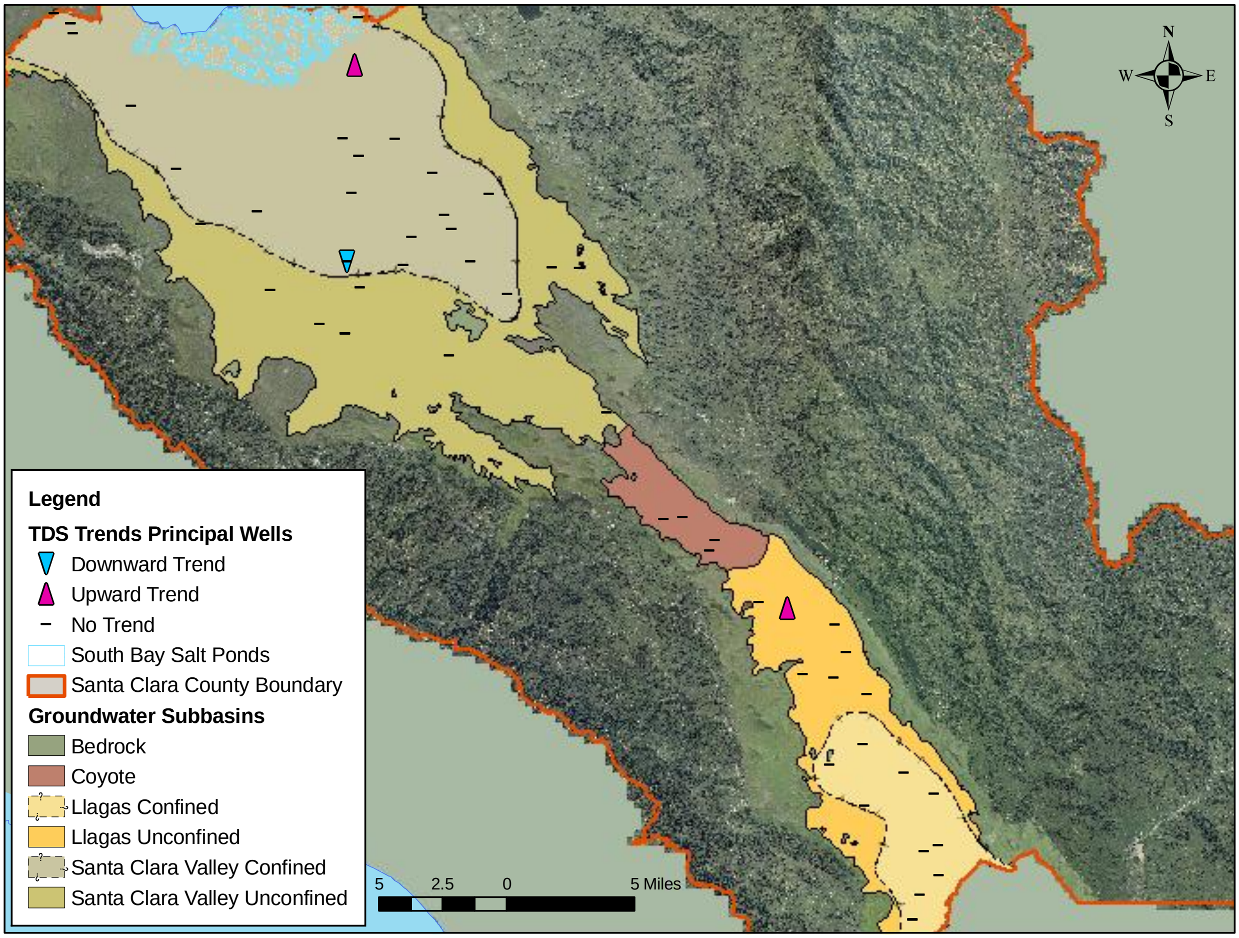

Figure 4. TDS Trends in Select Principal Aquifer Wells (1999-2008)

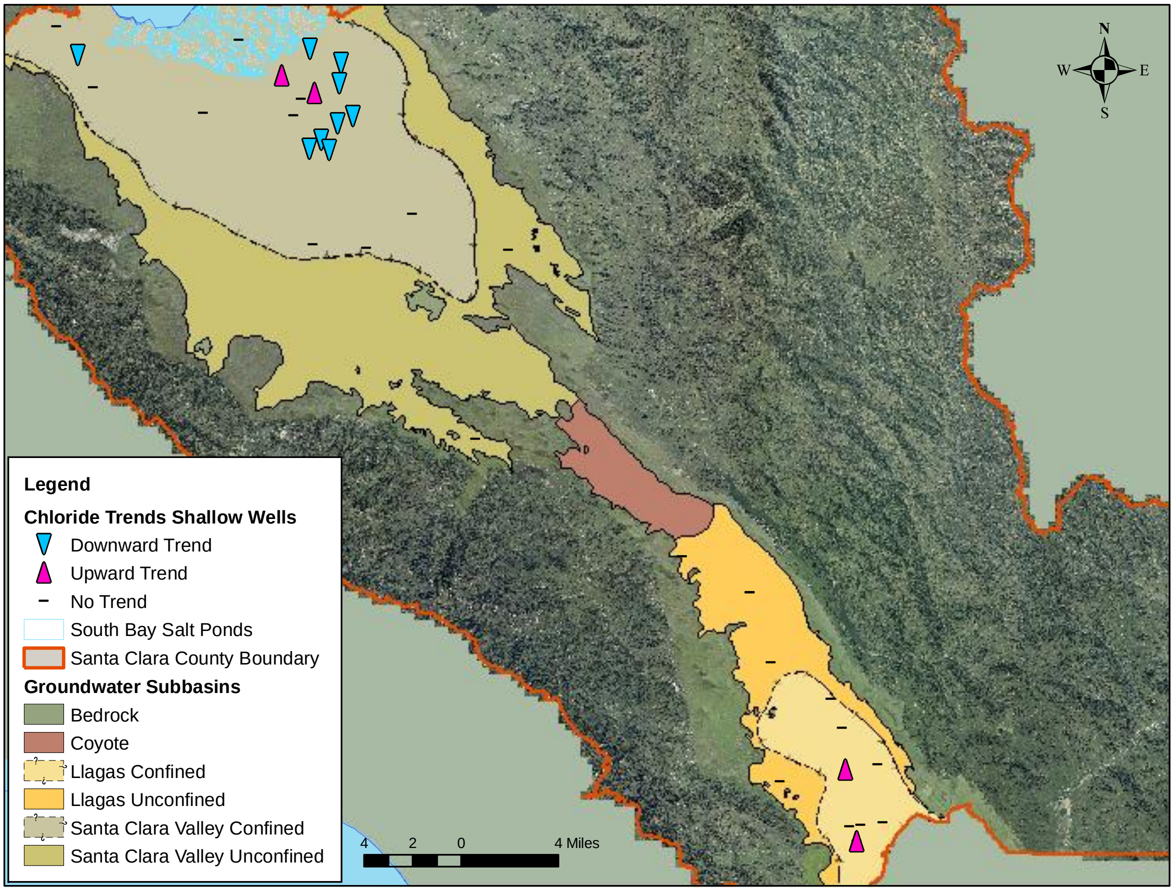

Figure 5. Chloride Trends in Select Shallow Aquifer Wells (1999-2008)

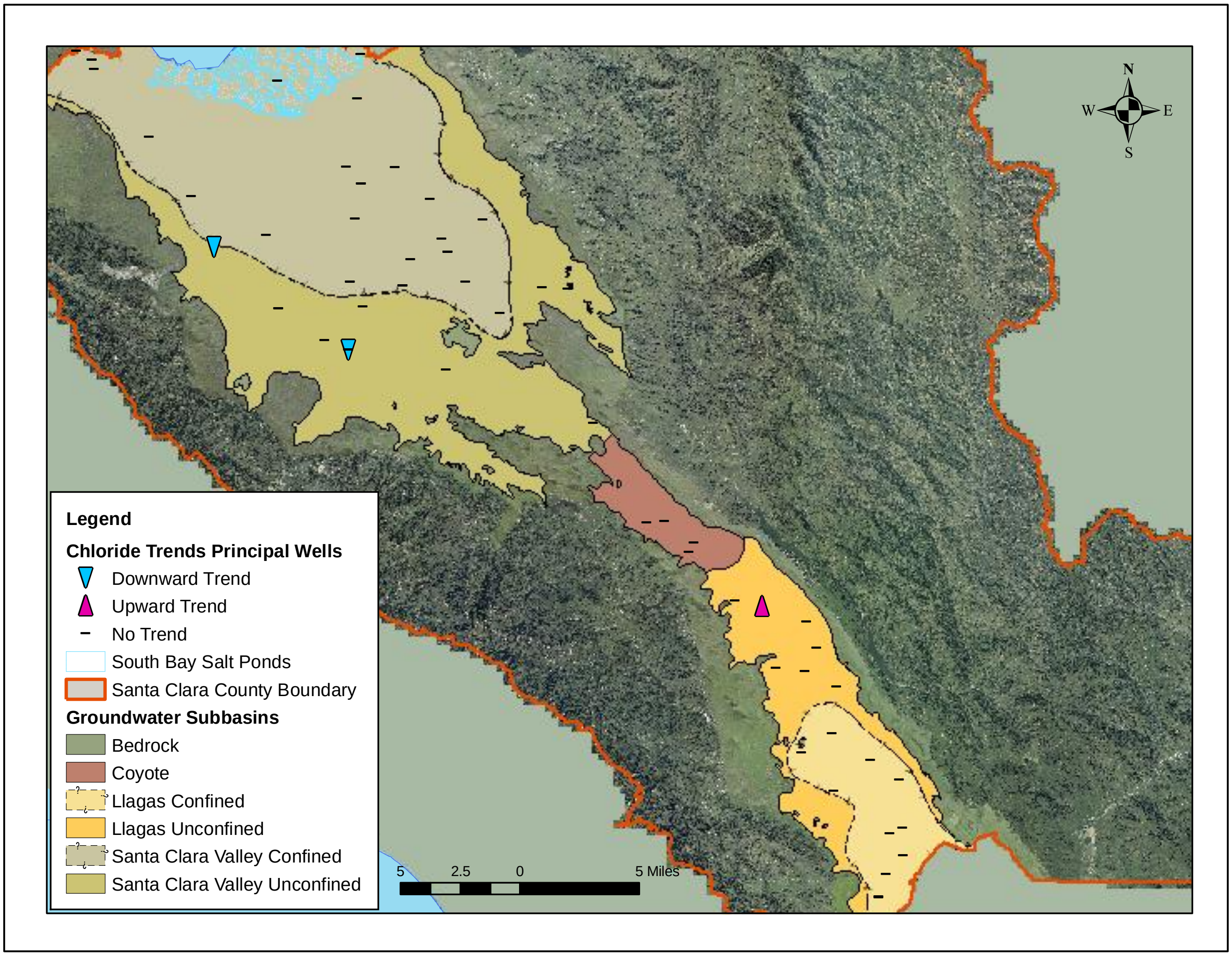

Figure 6. Chloride Trends in Select Principal Aquifer Wells (1999-2008)

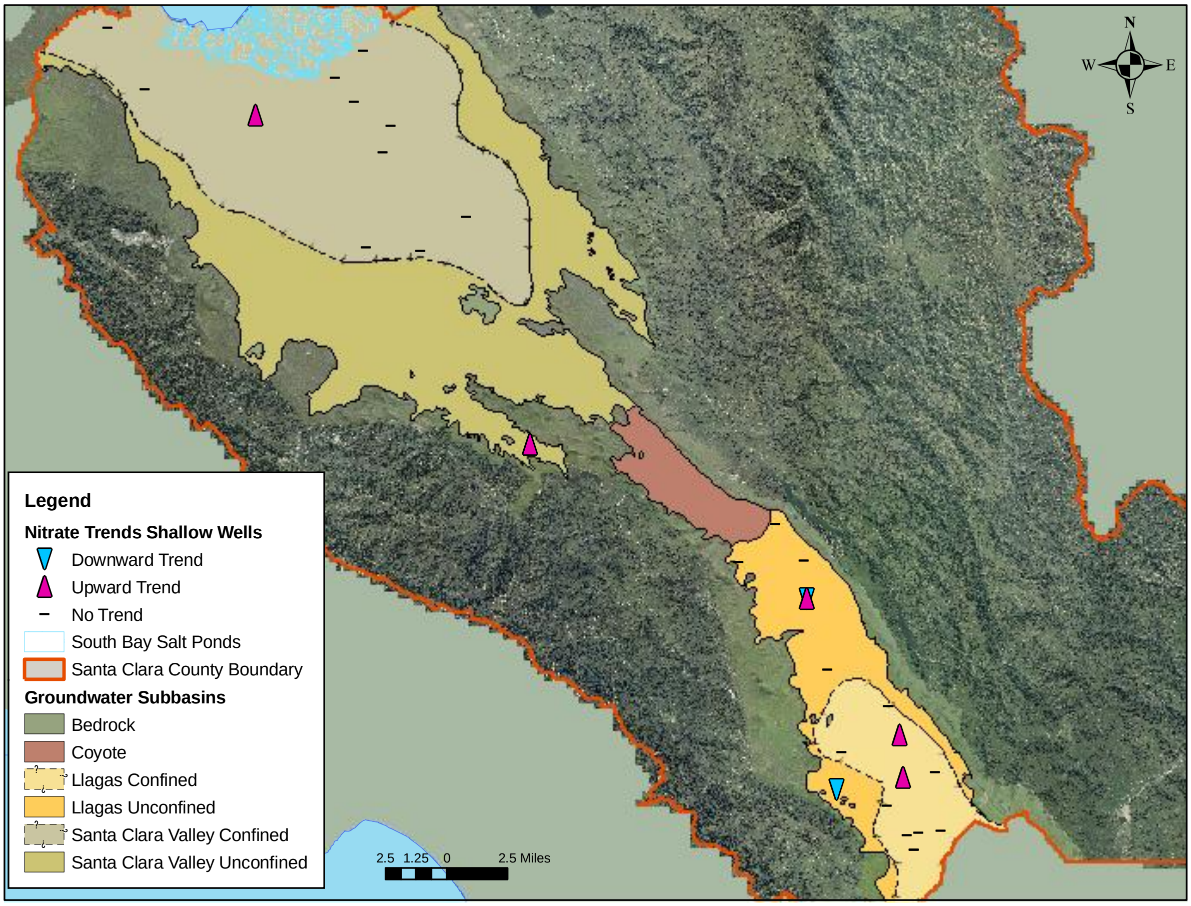

Figure 7. Nitrate Trends in Select Shallow Aquifer Wells (1999-2008)

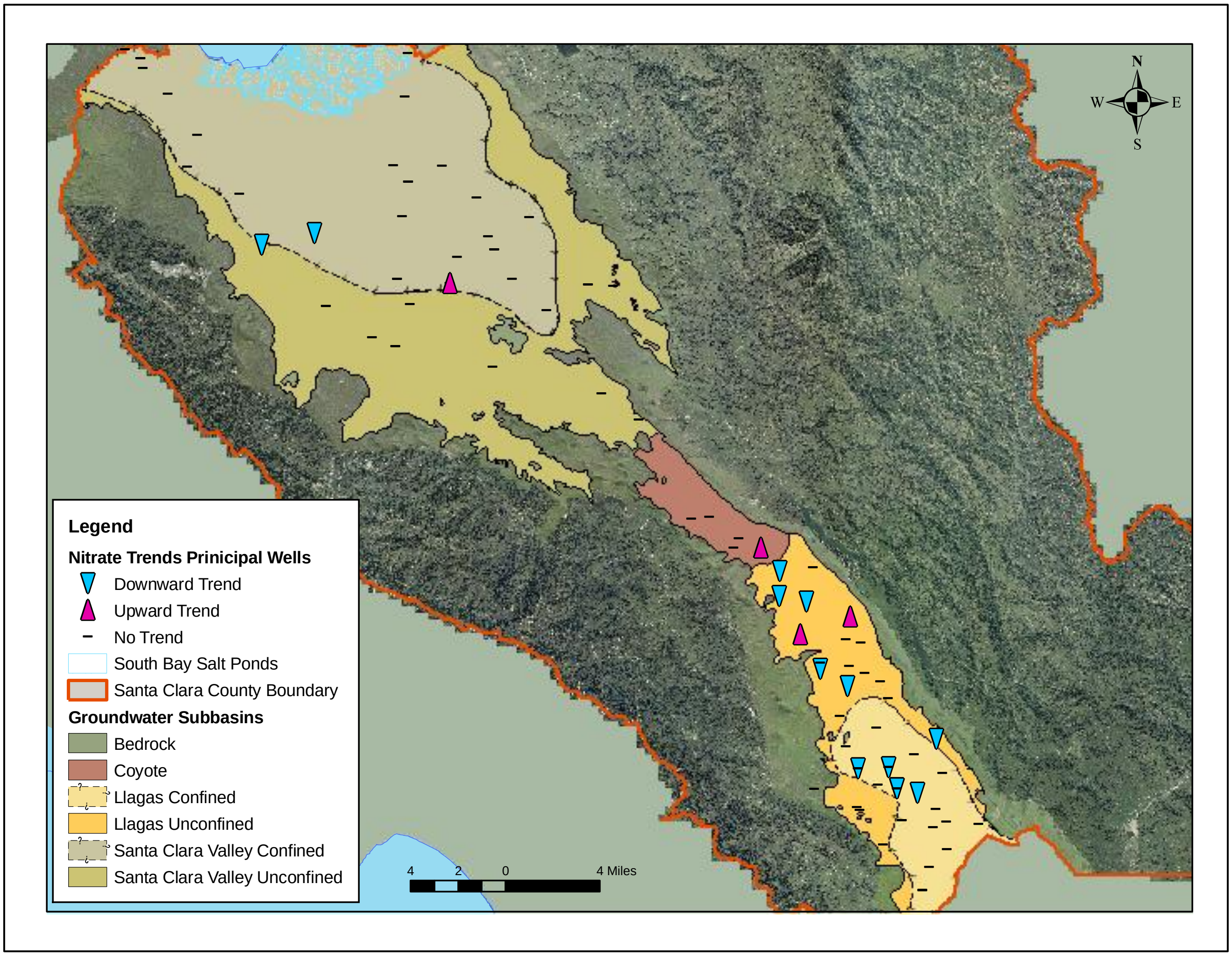

Figure 8. Nitrate Trends in Select Principal Aquifer Wells (1999-2008)

Saltwater Intrusion

Saltwater intrusion of the Santa Clara Subbasin shallow aquifer zone adjacent to the southern shore of the San Francisco Bay has been studied and monitored for many years by the District. Although the contamination has been somewhat widespread in the shallow aquifer zone, fortunately, the lower aquifer has not been affected significantly.

Chloride iso-concentrations of 100 mg/l, which indicates the first signs of saltwater contamination (SCVWD, 1980), and the secondary MCL of 250 mg/l are shown on Figure 9 for the shallow aquifer zone of the Santa Clara Subbasin. Saltwater intrusion is only possible when a body of saline water is in close proximity to freshwater aquifers. Since no other bodies of saline water exist in the County other than the San Francisco Bay, the other subbasins are not prone to this particular type of degradation. The 100 mg/l iso-concentration line has retreated somewhat in recent years along the Guadalupe River and many of the wells are showing a downward trend in chloride, suggesting that conditions are improving in the shallow aquifer zone. On the basis of historical information, the principal aquifer zone appears to have been affected only minimally. However, there are few active wells in the affected area available for testing, so it is not known whether conditions in the principal aquifer zone have changed significantly.

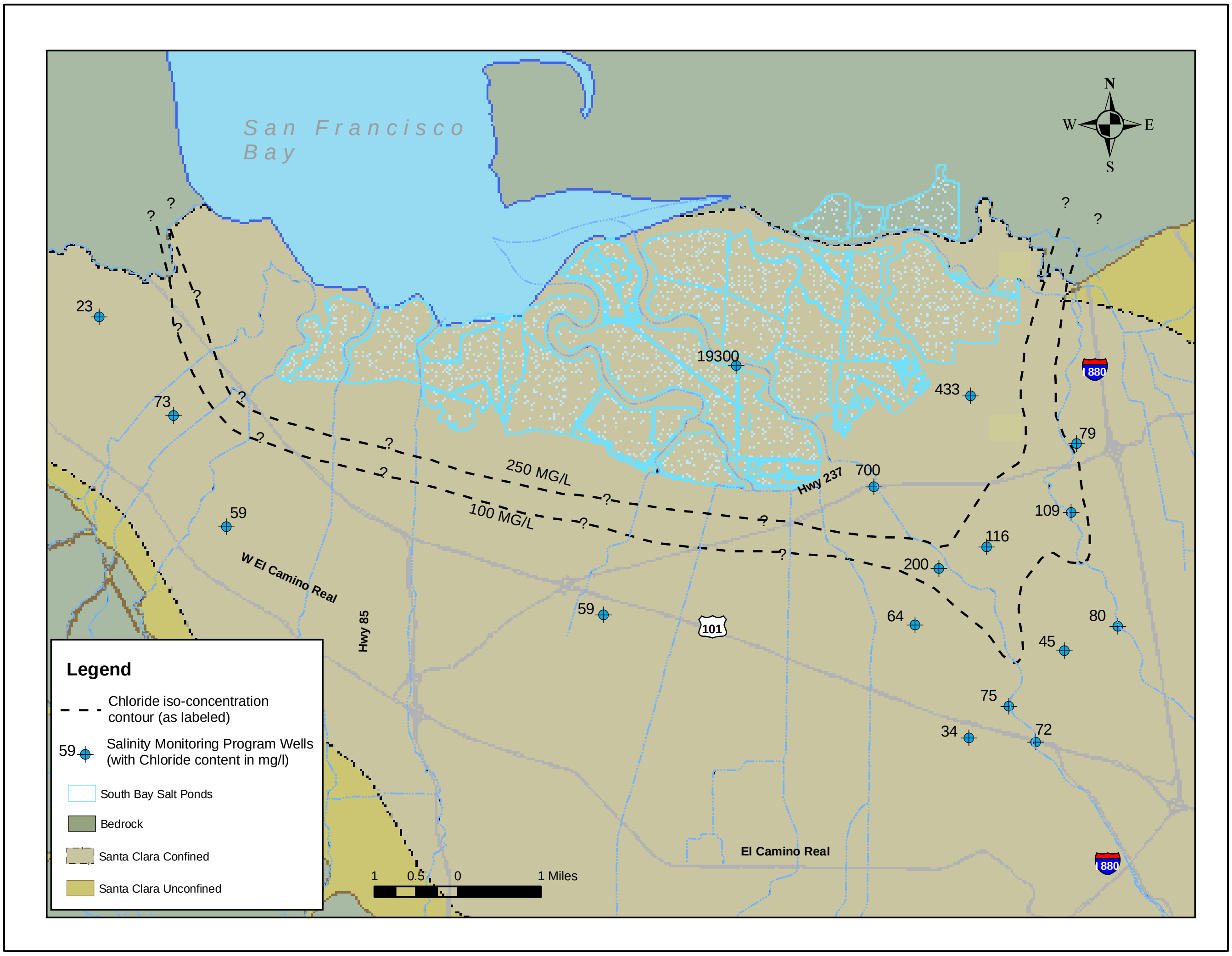

Figure 9. Chloride Iso-Concentration Contours

3.2 Coyote Subbasin

Unlike the Santa Clara and Llagas Subbasins which are subdivided into shallow and principal aquifer zones due to the presence of confining units, the Coyote Subbasin is generally unconfined. Therefore the data is not categorized into shallow and principal aquifer zones.

3.2.1 General Water Quality

Groundwater in the Coyote Subbasin is of mixed cation - bicarbonate character with no known exceptions. The mean TDS content is 394 mg/l with a standard deviation of 77.4 mg/l for 9 samples; this is well below the CDPH recommended SMCL of 500 mg/l. The median concentrations of other regulated inorganic constituents are shown in Table 3-1. Table 3-1 indicates that the 2008 median concentrations of common inorganic constituents meet primary drinking water standards without additional treatment.

3.2.2 Comparison of 2008 Data to Drinking Water Standards

Nitrate was the only constituent detected above the primary MCL in the Coyote Subbasin in 2008. Five wells used for domestic or municipal supply had concentrations ranging from 50 to 70.6 mg/l. It should be noted that for public water supply wells with nitrate above the MCL, blending or treatment was required prior to delivery to customers. Manganese, total dissolved solids, and electrical conductivity were detected above their respective SMCLs in one well with concentrations of 295 μg/l, 544 mg/l, and 1090 μS/cm respectively. There were no other constituents detected above drinking water standards in the Coyote Subbasin in 2008. This data is summarized in Table 3-5 below and the locations of the wells with exceedances are shown in Figure 10.

Wells in the Coyote Subbasin were also sampled for other constituents, which are not listed in Table 3-5 because no drinking water standard was exceeded. A summary of all constituents sampled in 2008, including the range of values and number of samples for each subbasin is provided in Appendix B.

Table 3-5. Constituents Detected Above Drinking Water Standards in 2008 Coyote Subbasin

Constituent	Number of Wells Sampled[1]	Number of Wells Exceeding DWS[2]	Concentrations in Wells with DWS Exceedances		Drinking Water Standard (DWS)	
			Median	Maximum	Primary MCL	Secondary MCL
Nitrate as NO_3 (mg/l)	23	5	62.8	70.6	45	--
Manganese (μg/l)	9	1	295	295	--	50
EC (μS/cm)	20	1	1,090	1,090	--	900
Total Dissolved Solids (mg/l)	9	1	544	544	--	500

1) Wells were also tested for other constituents, which are not listed in this table if no MCL or SMCL was exceeded. A summary of all constituents sampled and the range of concentrations is provided in Appendix B.

2) Some wells may have more than one constituent exceeding a drinking water standard. For public water supply wells with constituents detected above primary drinking water standards, blending or treatment is required prior to delivery to customers.

3.2.3 Comparison of 2008 Data to Agricultural Objectives

As with the Santa Clara Subbasin, groundwater quality was evaluated against established agricultural objectives. The only constituent detected above San Francisco RWQCB agricultural objectives was manganese as shown in Table 3-6, below.

Table 3-6. Constituents Detected Above Agricultural Objectives in 2008
Coyote Subbasin

Constituent	Number of Wells Sampled	Number of Wells Exceeding Agricultural Objective	Concentration in Wells with Exceedances		Agricultural Objective[1]
			Median	Maximum	
Manganese	9	1	295	295	200 μg/l

1) Agricultural objectives shown are threshold values from the San Francisco Regional Water Quality Control Board Basin Plan (Table 3-6).

3.2.4 Evaluation of Temporal Trends

The results of trend testing for TDS, chloride, and nitrate for the Coyote Subbasin are summarized in Table 3-7, below. The trend test procedure requires at least four sample events. Some of the wells located in the Coyote Subbasin cannot be tested for trend yet as they were installed somewhat recently and four data points are not available. It is anticipated that about 5 more wells will be eligible for trend testing after the 2009 sampling event. Results of trend testing for all eligible wells are illustrated geographically in Figures 4, 6, and 8.

Table 3-7. Trend Analyses for the Coyote Subbasin (1999-2008)

Constituent	Number of Wells Tested[1]	Well with no Apparent Trend	Wells with Upward Trend	Wells with Downward Trend
Total Dissolved Solids	4	4	0	0
Chloride	4	4	0	0
Nitrate	5	4	1	0

1) The number of wells tested for trend for each constituent and each zone varies, and was based on the availability of results for each constituent. A minimum of four results between 1999 and 2008 was required for the well to be included in the trend testing for a given constituent.

Only one well tested for trend showed an increasing trend for nitrate at a statistical confidence greater than 95%. There was insufficient evidence to assert trend for nitrate, chloride, and TDS for any of the other wells tested, although the number of wells tested so far is limited.

3.3 Llagas Subbasin

The Llagas Subbasin has been divided into shallow and principal aquifer zones similar to the Santa Clara Subbasin, with the upper 100 feet considered the shallow aquifer zone and all wells with a depth of more than 150 feet assigned to the principal aquifer zone.

3.3.1 General Water Quality

The Llagas Subbasin produces groundwater that is a mixed cation – bicarbonate type with some exceptions observed. Departures from the common water type may be due to elevated nitrate, evaporation pond use by a local wastewater treatment plant (MWH, 2007), or incomplete infiltration of surface water to deep zones.

The average TDS content of the principal aquifer zone is 406 mg/l with a standard deviation of 130 mg/l for 25 samples, which is below the SMCL of 500 mg/l. The median concentrations of other common inorganic constituents are shown in Table 3-1. Table 3-1 indicates that in 2008, the median values for common inorganic constituents were below drinking water standards, with the exception of nitrate in the shallow zone.

3.3.2 Comparison of 2008 Data to Drinking Water Standards

Concentrations of nitrate in six wells representing the shallow aquifer zone were greater than the MCL of 45 mg/l. The maximum concentration detected was 171 mg/l. No other constituents were detected above primary standards in the shallow aquifer zone monitoring wells. Five wells in the shallow aquifer zone were identified with total dissolved solids and electrical conductivity greater than SMCLs. In one of those wells, aluminum, iron, and manganese were also detected above their respective SMCLs (at 750 μg/L, 800 μg/L and 90 μg/L, respectively). In another of the five wells, manganese was also detected above the SMCL with a reported concentration of 345 μg/l. Table 3-8 summarizes the constituents detected above drinking water standards and Figure 10 illustrates their geographic location.

In the principal aquifer zone, three constituents were detected above their respective primary MCLs. Nitrate, perchlorate, and trichloroethylene (TCE) were detected above the MCL in 16 wells, two wells, and one well, respectively. Manganese, electrical conductivity, and total dissolved solids were the only constituents detected above secondary standards, affecting a total of 9 wells. Of these nine wells with exceedances of a secondary standard, 3 are for public water supply, 4 are for domestic water supply and two are dedicated monitoring wells.

Wells in the Llagas Subbasin were also sampled for other constituents, which are not listed in Table 3-8 because no drinking water standard was exceeded. A summary of all constituents sampled in 2008, including the range of values and number of samples for each subbasin is provided in Appendix B.

As elevated nitrate concentrations are an ongoing groundwater protection challenge, the District has undertaken numerous efforts to define the extent and severity of nitrate contamination, identify potential sources, reduce nitrate loading, and reduce customer exposure to nitrate. These efforts include, but are not limited to:

- Establishing a nitrate monitoring network of over 50 wells to assess nitrate occurrence and temporal trends.
- Performing free nitrate sampling for nearly 600 private wells since 1998.
- Implementing the Infield Nutrient Assessment and Assistance Program to provide on-site nutrient management assistance to growers from 2002 to 2007.
- Performing outreach regarding nitrate, including the preparation of focused outreach materials and presentations at annual small acreage stewardship workshops.

- Mailing annual postcards to all private well owners reminding them to test their well water quality.

The District also continues to monitor progress related to cleanup of the perchlorate plume in the Llagas Subbasin, which has impacted a number of private wells.

Table 3-8. Constituents Detected Above Drinking Water Standards in 2008
Llagas Subbasin

Constituent	Number of Wells Sampled[1]	Number of Wells Exceeding DWS[2]	Concentration in Wells with DWS Exceedances		Drinking Water Standard (DWS)	
			Median	Maximum	Primary MCL	Secondary MCL
Shallow Aquifer Zone						
Nitrate (mg/l)	10	6	69.2	171	45	--
Aluminum (μg/l)	7	1	750	750	1,000	200
EC (μS/cm)	7	5	1,040	1,350	--	900
Iron (mg/l)	7	1	800	800	--	300
Manganese (μg/l)	7	2	217	345	--	50
Total Dissolved Solids (mg/l)	7	5	578	736	--	500
Turbidity (ntu)	10	2	11	16.6	--	5
Principal Aquifer Zone						
Nitrate (mg/l)	94	16	55.4	87.8	45	--
Perchlorate (μg/l)	66	2	6.4	7.2	6	--
Trichloroethylene (TCE, μg/l)	30	1	21.0	21.0	5.0	--
EC (μS/cm)	59	6	980	1,200	--	900
Manganese (μg/l)	26	4	88	112	--	50
Total Dissolved Solids (mg/l)	25	4	652	698	--	500

1) Wells were also tested for other constituents, which are not listed in this table if no MCL or SMCL was exceeded. A summary of all constituents sampled and the range of concentrations is provided in Appendix B.

2) Some wells may have more than one constituent exceeding a drinking water standard. For public water supply wells with constituents detected above primary drinking water standards, blending or treatment is required prior to delivery to customers.

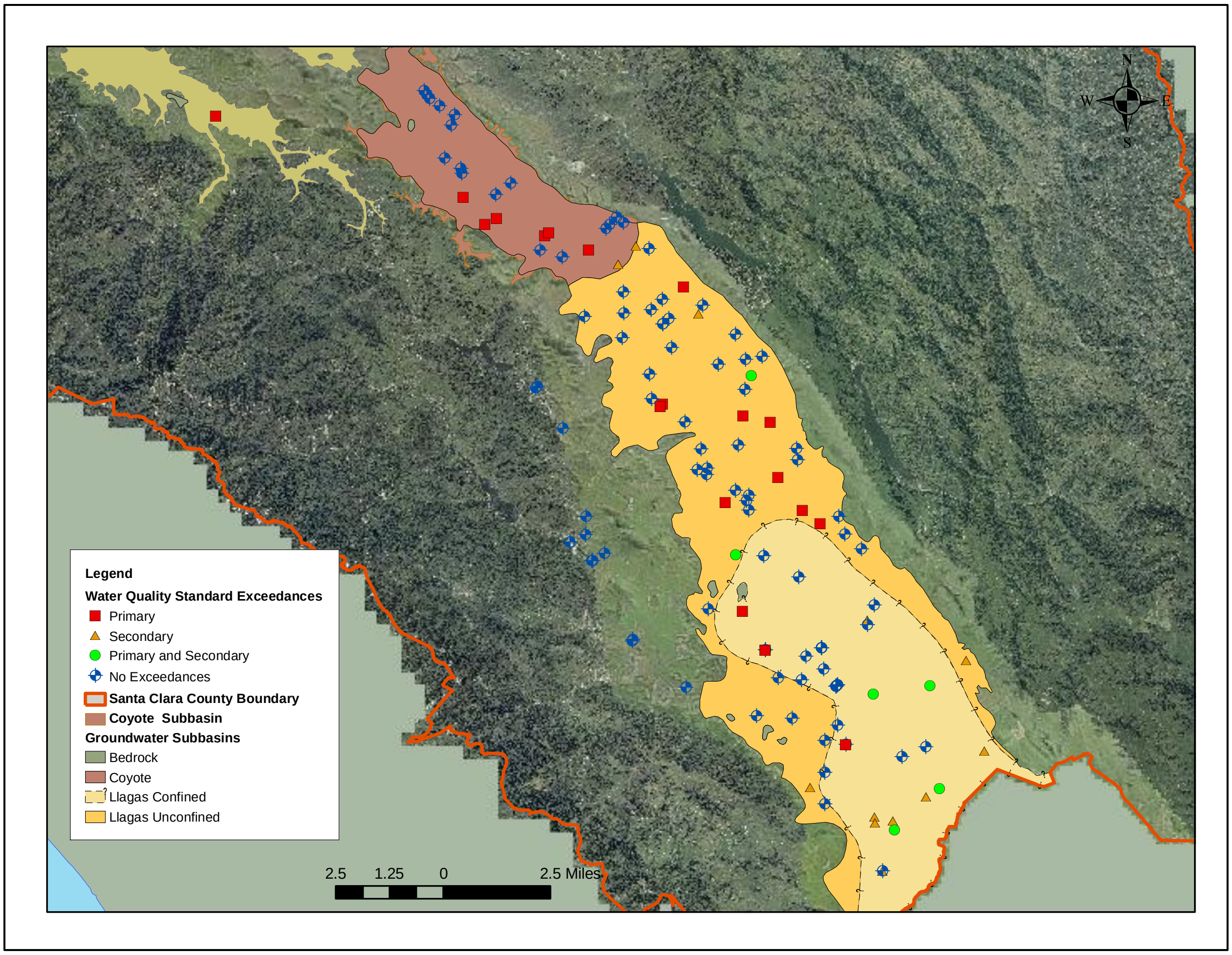

Figure 10. Wells with Constituents Detected Above Drinking Water Standards in 2008 Coyote and Llagas Subbasins

3.3.3 Comparison of 2008 Data to Agricultural Objectives

As with the other subbasins, an evaluation was also made to assess the quality of groundwater against established agricultural objectives. As the Llagas Subbasin is part of the Central Coast Hydrologic Region, this assessment was performed using the Central Coast RWQCB Basin Plan objectives as shown in Table 3-1 above. The only constituents detected above agricultural objectives are electrical conductivity (EC), chloride, and manganese as indicated in Table 3-9a and 3-9b below.

Table 3-9a. Constituents Detected Above Agricultural Objectives in 2008 Llagas Subbasin – Shallow Aquifer Zone

Constituent	Number of Wells Sampled	Number of Wells Exceeding Agricultural Objective	Concentrations in Wells with Exceedances		Agricultural Objective[1]
			Median	Maximum	
Electrical Conductivity	10	6	1,017	1,350	750 µS/cm
Chloride	7	1	160	160	142 mg/l
Manganese	7	1	345	345	200 µg/l

1) Agricultural objectives shown represent the low end of the range for "Increasing Problems" per the Central Coast Regional Water Quality Control Board Basin Plan (Table 3-3).

Table 3-9b. Constituents Detected Above Agricultural Objectives in 2008 Llagas Subbasin – Principal Aquifer Zone

Constituent	Number of Wells Sampled	Number of Wells Exceeding Agricultural Objective	Concentrations in Wells with Exceedances		Agricultural Objective[1]
			Median	Maximum	
Electrical Conductivity	78	14	861	1,040	750 µS/cm

1) Agricultural objectives shown represent the low end of the range for "Increasing Problems" per the Central Coast Regional Water Quality Control Board Basin Plan (Table 3-3).

According to Table 3-3 of the Central Coast Basin Plan, the objective for EC of 750 µS/cm is at the lower end of the range for "increasing problems." "Severe problems" do not develop until an electrical conductivity of 3,000 µS/cm is reached. All the wells having EC greater than the value used for this analysis (lowest limit) are far below the level in which severe problems would be expected to occur. District staff will continue to monitor potential water quality changes that may impact beneficial uses, including agriculture.

3.3.4 Evaluation of Temporal Trends

The results of trend testing for TDS, chloride and nitrate for wells representing the shallow and principal aquifer zones in the Llagas Subbasin are summarized in Table 3-10 below. Results of trend testing are illustrated geographically on Figures 3 through 8, above.

Table 3-10. Trend Analyses for the Llagas Subbasin (1999-2008)

Constituent	Number of Wells Tested[1]	Wells with no Apparent Trend	Wells with Upward Trend	Wells with Downward Trend
Shallow Aquifer Zone				
Total Dissolved Solids	16	16	0	0
Chloride	14	12	2	0
Nitrate	21	16	3	2
Principal Aquifer Zone				
Total Dissolved Solids	18	17	1	0
Chloride	18	17	1	0
Nitrate	45	32	2	11

1) The number of wells tested for trend for each constituent and each zone varies, and was based on the availability of results for each constituent. A minimum of four results between 1999 and 2008 was required for the well to be included in the trend testing for a given constituent.

Several wells in both the shallow and principal aquifer zone indicate increasing trends for nitrate. However, the majority of wells where a trend can be asserted for nitrate show decreasing trends. Two wells in the shallow zone and 11 wells in the principal zone show downward trends in nitrate concentration suggesting water quality improvements in some areas.

4.0 2008 Groundwater Quality Monitoring Summary

As part of the District's groundwater quality monitoring program, analytical results from samples collected by the District and water suppliers in calendar year 2008 were evaluated in relation to drinking water standards and agricultural objectives. In addition, temporal trends in water quality were analyzed for nitrate, TDS, and chloride. Physical properties, major ions, trace elements, and volatile and non-volatile organic compounds were measured in as many as 376 wells comprised of mostly municipal or domestic supply wells with a smaller number of dedicated monitoring wells.

The median 2008 concentrations for common inorganic constituents are generally well below California Department of Public Health (CDPH) drinking water standards and Regional Water Quality Control Board agricultural water quality objectives for each subbasin and aquifer zone (Table 3-1). Exceptions are nitrate (the median concentration in the Llagas Subbasin shallow zone exceeds the primary, health-based standard) and manganese (the median concentration in the Santa Clara Subbasin shallow zone exceeds the secondary, aesthetic-based standard).

The majority of wells within Santa Clara County produce high-quality water that meets primary drinking water standards. Exceptions for each subbasin are noted below in Table 3-11.

Table 3-11
Wells with Constituents Exceeding Drinking Water Standards (DWS) in 2008

Subbasin and Zone	**Primary Health-Based DWS**	**Notes**
Santa Clara Shallow Zone	Arsenic – 2 wells	Arsenic and cadmium standards were exceeded at monitoring wells.
	Cadmium – 1 well	
Santa Clara Principal Zone	Nitrate – 1 well	The nitrate standard was exceeded at a private domestic well while the arsenic standard was exceeded at a monitoring well.
	Arsenic – 1 well	
Coyote Principal Zone	Nitrate – 5 wells	The nitrate standard was exceeded at 5 water supply wells.
Llagas Shallow Zone	Nitrate – 6 wells	All nitrate exceedances occurred at monitoring wells.
Llagas Principal Zone	Nitrate – 16 wells	The nitrate exceedances occurred at 5 water supply wells, 8 domestic wells, and 3 monitoring wells. Both the TCE and perchlorate exceedances occurred at supply wells.
	TCE – 1 well	
	Perchlorate – 2 wells	

Note: For public water supply wells with constituents detected above primary drinking water standards, blending or treatment is required prior to delivery to customers.

The constituents most frequently detected above primary, health-based drinking water standards in the County were nitrate followed by arsenic, cadmium, and perchlorate. Nitrate was detected above primary MCLs in approximately 8% of wells tested county-wide, arsenic was detected above primary MCLs in approximately 2% of wells, and cadmium, perchlorate, and TCE were present above MCLs in less than 1% of wells tested. For public water supply wells, detections above primary drinking water standards require that the water supplier blend or treat the water prior to delivery to customers. Volatile and non-volatile organic compounds were seldom detected above standard laboratory detection limits, and only one well had a detection above primary drinking water standards (TCE as mentioned above).

With regard to secondary (aesthetic-based) drinking water standards, TDS, electrical conductivity, manganese, iron, aluminum, chloride, sulfate, and zinc were detected above SMCLs in one or more wells in the County. TDS, electrical conductivity, manganese and iron were detected above the SMCL most frequently, in approximately 25%, 19%, 16%, and 8% of the wells tested, respectively. The other constituents were detected above their respective SMCLs much less frequently. It should be noted that the comparison to drinking water standards relied on the lowest CDPH limits for constituents such as TDS, which are given as a range. This approach allows for the early identification of potential impacts to beneficial use before problems become severe or intractable.

Some impacts are noted, including elevated nitrate in portions of the Coyote and Llagas Subbasins, and elevated levels of total dissolved solids, electrical conductivity, manganese and iron at various wells throughout the County. These localized impacts present some challenges to water suppliers, who may need to blend or treat the water prior to delivery. However, in general the County's three groundwater subbasins produce high-quality water to support the beneficial use of municipal and domestic supply, with the majority of wells meeting all primary and secondary drinking water standards.

Groundwater quality was also evaluated against established agricultural objectives. In the Llagas Subbasin, the Central Coast RWQCB's lowest electrical conductivity objective was exceeded at 18% of wells tested. However, no wells were found to have electrical conductivity greater than the upper limit at which point severe problems would be expected to occur. The other constituents detected above agricultural objectives in the County were chloride, Sodium Adsorption Ratio (SAR), boron, and manganese, but these exceedances were limited to a few wells each. It should be noted that the comparison to agricultural objectives relied on the lowest values listed in the appropriate Basin Plans. Again, this allows for the early identification of potential impacts to beneficial use.

County-wide trend analyses for TDS, chloride, and nitrate were conducted for 97, 105, and 129 well sites, respectively using ten years of data (1999-2008). There were upward trends asserted at 4% of wells for TDS, 5% of wells for chloride, and 7% of wells for nitrate. There were downward trends asserted at 2% of wells for TDS, 10% of wells for chloride, and 12% of wells for nitrate. The remaining wells did not indicate clear evidence of trends. A breakdown of trends per subbasin is listed in Table 4-1 below. District staff will continue to perform trend analysis for select constituents that may provide early warning of potential groundwater degradation.

Table 4-1. Summary of Trend Analyses

Constituent	Number of Wells Tested[1]	Percent of Wells with Increasing Trends	Percent of Wells with Decreasing Trends	Percent of Wells with no Apparent Trend
Santa Clara Subbasin, Shallow Aquifer Zone				
Total Dissolved Solids	14	14%	7%	79%
Chloride	22	9%	41%	50%
Nitrate	14	14%	0%	86%
Santa Clara Subbasin, Principal Aquifer Zone				
Total Dissolved Solids	45	2%	2%	96%
Chloride	47	0%	4%	96%
Nitrate	44	2%	5%	93%
Coyote Subbasin				
Total Dissolved Solids	4	0%	0%	100%
Chloride	4	0%	0%	100%
Nitrate	5	20%	0%	80%
Llagas Subbasin, Shallow Aquifer Zone				
Total Dissolved Solids	16	0%	0%	100%
Chloride	14	14%	0%	86%
Nitrate	21	14%	10%	76%
Llagas Subbasin, Principal Aquifer Zone				
Total Dissolved Solids	18	6%	0%	94%
Chloride	18	6%	0%	94%
Nitrate	45	4%	24%	71%

1) The number of wells tested for trend for each constituent and each zone varies, and was based on the availability of results for each constituent. A minimum of four results between 1999 and 2008 was required for the well to be included in the trend testing for a given constituent.

A review of the District monitoring frequency for certain constituents is recommended, including VOCs, which frequently result in non-detect concentrations and trace metals which do not change considerably from year to year. This will require a thorough review of existing data coupled with statistical analyses to determine a more appropriate sampling frequency.

District Board Ends Policy directs staff to ensure "The groundwater basins are protected from contamination and the threat of contamination." Analysis of 2008 groundwater quality data from the District's monitoring program and compliance monitoring performed by water suppliers indicates that, for the most part, this end is achieved as groundwater in Santa Clara County generally meets established water quality objectives, including drinking water standards and agricultural objectives. The District continues to implement nitrate management activities, track progress on the perchlorate plume cleanup in the Llagas Subbasin, and work to aggressively protect groundwater resources from potential contamination.

References

Santa Clara Valley Water District, 1980. Saltwater intrusion investigation in the Santa Clara County Baylands area, California

MWH, 2007. Salt Management Report, South County Regional Wastewater Authority.

Appendix A

Parameters Analyzed in 2008

Major Inorganics

AGGRESSIVE INDEX (CORROSIVITY)
ALKALINITY (TOTAL) AS CACO3
BICARBONATE ALKALINITY AS CACO3
BORON
BROMIDE
CALCIUM
CALCIUM AS CACO3
CARBON DIOXIDE
CARBONATE ALKALINITY
CHLORIDE
FLUORIDE (NATURAL SOURCE)
FOAMING AGENTS (MBAS)
HARDNESS (TOTAL) AS CACO3
HYDROXIDE ALKALINITY
LANGELIER INDEX @ 60 C
MAGNESIUM
NITRATE (AS NO3)
NITRATE + NITRITE (AS N)
NITRITE (AS N)
POTASSIUM
SILICA
SODIUM
SODIUM ABSORPTION RATIO
SULFATE
TOTAL DISSOLVED SOLIDS
TURBIDITY, FIELD
TURBIDITY, LABORATORY

Minor Inorganics

ALUMINUM
ANTIMONY
ARSENIC
ASBESTOS
BARIUM
BERYLLIUM
CADMIUM
CARBON DISULFIDE
CHROMIUM (TOTAL)
CHROMIUM, HEXAVALENT
COPPER
CYANIDE
IRON
LEAD
MANGANESE
MERCURY
NICKEL
SELENIUM
SILVER
THALLIUM
VANADIUM
ZINC

Volatile Organic Compounds (VOC)

1,1,1,2-TETRACHLORETHANE
1,1,1-TRICHLOROETHANE
1,1,2,2-TETRACHLOROETHANE
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (FREON 113)
1,1,2-TRICHLOROETHANE
1,1-DICHLOROETHANE
1,1-DICHLOROETHYLENE
1,1-DICHLOROPROPANE
1,1-DICHLOROPROPENE
1,2,3-TRICHLOROBENZENE
1,2,3-TRICHLOROPROPANE
1,2,4-TRICHLOROBENZENE
1,2,4-TRIMETHYLBENZENE
1,2-DICHLOROBENZENE
1,2-DICHLOROETHANE
1,2-DICHLOROPROPANE
1,3,5-TRIMETHYLBENZENE
1,3-DICHLOROBENZENE
1,3-DICHLOROPROPANE
1,3-DICHLOROPROPENE (TOTAL)
1,4-DICHLOROBENZENE
1-PHENYLPROPANE (N-PROPYLBENZENE)
2,2-DICHLOROPROPANE

VOC continued

2-CHLOROETHYLVINYL ETHER
2-CHLOROTOLUENE
4-CHLOROTOLUENE
ACETONE
BENZENE
BIS (2-CHLOROETHYL) ETHER
BROMOBENZENE
BROMOCHLOROMETHANE
BROMODICHLOROMETHANE (THM)
BROMOFORM (THM)
BROMOMETHANE
CARBON TETRACHLORIDE
CHLOROETHANE
CHLOROFORM (THM)
CHLOROMETHANE
CIS-1,2-DICHLOROETHYLENE
CIS-1,3-DICHLOROPROPENE
DIBROMOACETIC ACID
DIBROMOCHLOROMETHANE (THM)
DIBROMOMETHANE
DICHLOROACETIC
DICHLORODIFLUOROMETHANE (FREON 12)
DICHLOROMETHANE
DIISOPROPYL ETHER
ETHYLBENZENE
ETHYL-TERT-BUTYL ETHER
HEXACHLOROBUTADIENE
ISOPROPYLBENZENE
M,P-XYLENE
METHYL ETHYL KETONE (MEK, BUTANONE)
METHYL ISOBUTYL KETONE
METHYL-TERT-BUTYL-ETHER (MTBE)
MONOCHLOROBENZENE
NAPHTHALENE
N-BUTYLBENZENE
O-XYLENE
P-ISOPROPYLTOLUENE
SEC-BUTYLBENZENE
STYRENE
TERT-AMYL-METHYL ETHER
TERT-BUTYL ALCOHOL
TERT-BUTYLBENZENE
TETRACHLOROETHYLENE
TOLUENE
TOTAL TRIHALOMETHANES
TRANS-1,2-DICHLOROETHYLENE
TRANS-1,3-DICHLOROPROPENE
TRICHLOROACETIC ACID
TRICHLOROETHYLENE
TRICHLOROFLUOROMETHANE (FREON 11)
VINYL CHLORIDE
XYLENES (TOTAL)

Semi-Volatile Compounds

2,3,7,8-TCDD (DIOXIN)
2,4,5-T
2,4,5-TP (SILVEX)
2,4-D
3-HYDROXYCARBOFURAN
ALACHLOR
ALDICARB
ALDICARB SULFONE
ALDICARB SULFOXIDE
ALDRIN
ATRAZINE
BENTAZON
BENZO (A) PYRENE
BROMACIL
BUTACHLOR
CARBARYL
CARBOFURAN
CHLORDANE
CHLOROTHALONIL
DALAPON
DI(2-ETHYLHEXYL)ADIPATE
DI(2-ETHYLHEXYL)PHTHALATE

Semi-Volatile Compounds (cont)

DIAZINON
DIBROMOCHLOROPROPANE (DBCP)
DICAMBA
DIELDRIN
DIMETHOATE
DINOSEB
DIQUAT
DIURON
ENDOTHALL
ENDRIN
ETHYLENE DIBROMIDE (EDB)
GAMMA-BHC (LINDANE), TOTAL
GLYPHOSATE
HEPTACHLOR
HEPTACHLOR EPOXIDE
HEXACHLOROBENZENE
HEXACHLOROCYCLOPENTADIENE
METHOMYL
METHOXYCHLOR
METOLACHLOR
METRIBUZIN
MOLINATE
OXAMYL
PARAQUAT
PENTACHLOROPHENOL
PICLORAM
PROPACHLOR
SIMAZINE
THIOBENCARB
TOXAPHENE

Radionuclides

GROSS ALPHA
GROSS ALPHA COUNTING ERROR
RADIUM 226
RADIUM 226 COUNTING ERROR
RADIUM 228
RADIUM 228 COUNTING ERROR

Physical Properties

COLOR
ODOR THRESHOLD @ 60 C
OXYGEN, DISSOLVED
PH, FIELD
PH, LABORATORY
SOURCE TEMPERATURE C
SPECIFIC CONDUCTANCE
SPECIFIC CONDUCTANCE, FIELD

Miscellaneous

PERCHLORATE
PCB-1016
PCB-1221
PCB-1232
PCB-1242
PCB-1248
PCB-1254
PCB-1260
POLYCHLORINATED BIPHENYLS (TOTAL PCB'S)

Appendix B

Summary Table of all Parameters Analyzed in 2008

CHEMICAL NAME		**Santa Clara Subbasin**			**Coyote Subbasin**			**Llagas Subbasin**			**MCL**	**SMCL**
	Unit	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**		
1,1,1,2-TETRACHLORETHANE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
1,1,1-TRICHLOROETHANE	UG/L	232	<0.5	3.18	15	<0.5	<0.5	62	<0.5	<0.5	200	
1,1,2,2-TETRACHLOROETHANE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	1	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (FREON 113)	UG/L	232	<10	<10	15	<10	<10	62	<10	<10	1200	
1,1,2-TRICHLOROETHANE	UG/L	236	<0.5	2.7	15	<0.5	<0.5	62	<0.5	<0.5	5	
1,1-DICHLOROETHANE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	5	
1,1-DICHLOROETHYLENE	UG/L	232	<0.5	3.26	15	<0.5	<0.5	62	<0.5	<0.5	6	
1,1-DICHLOROPROPANE	UG/L	38	<0.5	<0.5	6	<0.5	<0.5	25	<0.5	<0.5		
1,1-DICHLOROPROPENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
1,2,3-TRICHLOROBENZENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
1,2,3-TRICHLOROPROPANE	UG/L	151	<0.005	<0.005	8	<0.005	<0.005	61	<0.005	<0.005		
1,2,4-TRICHLOROBENZENE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	5	
1,2,4-TRIMETHYLBENZENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
1,2-DICHLOROBENZENE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	600	
1,2-DICHLOROETHANE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	0.5	
1,2-DICHLOROPROPANE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	5	
1,3,5-TRIMETHYLBENZENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
1,3-DICHLOROBENZENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
1,3-DICHLOROPROPANE	UG/L	230	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
1,3-DICHLOROPROPENE (TOTAL)	UG/L	231	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	0.5	
1,4-DICHLOROBENZENE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	5	
1-PHENYLPROPANE (N-PROPYLBENZENE)	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
2,2-DICHLOROPROPANE	UG/L	176	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
2,3,7,8-TCDD (DIOXIN)	UG/L	71	<5E-06	<5E-06	4	<5E-06	<5E-06	--	--	--	3E-05	
2,4,5-T	UG/L	36	<1	<1	--	--	--	13	<1	<1		
2,4,5-TP (SILVEX)	UG/L	166	<1	<1	5	<1	<1	13	<1	<1	50	
2,4-D	UG/L	168	<10	<10	5	<10	<10	13	<10	<10	70	
2-CHLOROETHYLVINYL ETHER	UG/L	22	<2	<2	--	--	--	--	--	--		

CHEMICAL NAME		**Santa Clara Subbasin**			**Coyote Subbasin**			**Llagas Subbasin**				
	Unit	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**MCL**	**SMCL**
2-CHLOROTOLUENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
3-HYDROXYCARBOFURAN	UG/L	153	<3	<3	2	<3	<3	3	<3	<3		
4-CHLOROTOLUENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
ACETONE	UG/L	8	<10	<10	1	<10	<10	9	<10	<10		
ACRYLONITRILE	UG/L	7	<5	<5	--	--	--	--	--	--		
AGGRESSIVE INDEX (CORROSIVITY)		68	12	13	2	12	12	3	12	13		
ALACHLOR	UG/L	167	<1	<1	5	<1	<1	10	<1	<1	2	
ALDICARB	UG/L	153	<3	<3	2	<3	<3	3	<3	<3		
ALDICARB SULFONE	UG/L	153	<4	<4	2	<4	<4	3	<4	<4		
ALDICARB SULFOXIDE	UG/L	153	<3	<3	2	<3	<3	3	<3	<3		
ALDRIN	UG/L	153	<0.075	<0.075	2	<0.07	<0.07	--	--	--		
ALKALINITY (TOTAL) AS CACO3	MG/L	125	98	533	9	162	345	28	132	381		
ALUMINUM	UG/L	132	<50	760	16	<10	68	31	<50	750	1000	200
AMMONIA (NH3-N)	MG/L	1	<1	<1				--	--	--		
ANTIMONY	UG/L	125	<6	<6	13	<6	<6	32	<6	<6	6	
ARSENIC	UG/L	125	<2	27	13	<2	<2	31	<2	4.1	10	
ASBESTOS	MFL	10	<0.2	<0.2	--	--	--	2	<0.2	<0.2	7	
ATRAZINE	UG/L	167	<0.55	<0.3	5	<0.5	<0.5	11	<0.5	<0.5	1	
BARIUM	UG/L	125	<100	370	13	71.5	140	31	<100	250	1000	
BENTAZON	UG/L	164	<2	<2	5	<2	<2	13	<2	<2	18	
BENZENE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	1	
BENZO (A) PYRENE	UG/L	165	<0.1	<0.1	5	<0.1	<0.1	11	<0.1	<0.1	0.2	
BERYLLIUM	UG/L	125	<1	<1	13	<1	<1	32	<1	<1	4	
BICARBONATE ALKALINITY	MG/L	125	101	534	9	162	345	28	132	400		
BIS (2-CHLOROETHYL) ETHER	UG/L	--	--	--	1	<5	<5	--	--	--		
BORON	UG/L	38	<100	3680	6	75	148	26	<50	306		
BROMACIL	UG/L	152	<10	<10	2	<10	<10	10	<10	<10		

CHEMICAL NAME		**Santa Clara Subbasin**			**Coyote Subbasin**			**Llagas Subbasin**				
	Unit	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**MCL**	**SMCL**
BROMIDE	MG/L	38	<0.05	61.4	6	0.1	0.3	25	<0.05	0.57		
BROMOBENZENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
BROMOCHLOROMETHANE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
BROMODICHLOROMETHANE (THM)	UG/L	226	<1	<1	10	<1	<1	62	<0.5	<0.5		
BROMOFORM (THM)	UG/L	227	<1	7.27	12	<1	<1	64	<1	1.3		
BROMOMETHANE	UG/L	136	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
BUTACHLOR	UG/L	152	<0.42	<0.42	2	<0.4	<0.4	10	<0.38	<0.38		
CADMIUM	UG/L	125	<1	18	13	<1	<1	31	<1	<1	5	
CAFFEINE	UG/L	115	<0.05	<0.05	--	--	--	--	--	--		
CALCIUM	MG/L	124	13.8	521	9	30.2	73	28	34.9	107		
CALCIUM AS CACO3	MG/L	37	34.5	1300	6	75.5	167	25	21.5	268		
CARBARYL	UG/L	153	<5	<5	2	<5	<5	3	<5	<5		
CARBOFURAN	UG/L	166	<5	<5	5	<5	<5	3	<5	<5	18	
CARBON DIOXIDE	UG/L	48	2200	16000	2	4600	7600	--	--	--		
CARBON DISULFIDE	UG/L	7	<0.5	<0.5	--	--	--	5	<0.5	<0.5		
CARBON TETRACHLORIDE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	0.5	
CARBONATE ALKALINITY	MG/L	125	<5	<5	3	<5	<5	28	<1	<1		
CHLORATE	UG/L	1	260	260	--	--	--	--	--	--		
CHLORDANE	UG/L	166	<0.1	<0.1	5	<0.1	<0.1	--	--	--	0.1	
CHLORIDE	MG/L	132	<10	19300	9	16	114	29	13	160		500
CHLOROBENZENE	UG/L	--	--	--	15	<0.5	<0.5	--	--	--		
CHLOROETHANE	UG/L	136	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
CHLOROFORM (THM)	UG/L	227	<1	7.49	12	<1	<1	64	<1	<0.5		
CHLOROMETHANE	UG/L	136	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
CHLOROTHALONIL	UG/L	36	<5	<5	--	--	--	--	--	--		
CHROMIUM (TOTAL)	UG/L	125	<10	23.611	13	<2	3.3	31	<10	<10	50	
CHROMIUM, HEXAVALENT	UG/L	1	<1	<1	--	--	--	--	--	--		

CHEMICAL NAME		**Santa Clara Subbasin**			**Coyote Subbasin**			**Llagas Subbasin**				
	Unit	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**MCL**	**SMCL**
CIS-1,2-DICHLOROETHYLENE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	6	
CIS-1,3-DICHLOROPROPENE	UG/L	47	<0.5	<0.5	8	<0.5	<0.5	53	<0.5	<0.5	0.5	
COLOR	UNITS	87	<5	10	3	<5	<5	4	<5	<5		15
COPPER	UG/L	126	<50	<50	9	<50	<50	28	<50	14.4	1300	1000
CYANIDE	UG/L	104	<100	<100	5	<100	<100	7	<100	<100	150	
DALAPON	UG/L	166	<10	<10	5	<10	<10	13	<10	<10	200	
DCPA (TOTAL DI & MONO ACID DEGRADATES)	UG/L	117	<1	<1	2	<1	<1	--	--	--		
DI(2-ETHYLHEXYL)ADIPATE	UG/L	165	<5	<5	5	<5	<5	11	<5	<5	400	
DI(2-ETHYLHEXYL)PHTHALATE	UG/L	165	<3	<3	5	<3	<3	11	<3	<3	4	
DIAZINON	UG/L	152	<0.28	<0.1	2	<0.1	<0.1	10	<0.25	<0.25		
DIBROMOCHLOROMETHANE (THM)	UG/L	227	<1	1.3	12	<1	<1	64	<1	<1		
DIBROMOCHLOROPROPANE (DBCP)	UG/L	187	<0.01	<0.01	6	<0.01	<0.01	--	--	--	0.2	
DIBROMOMETHANE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
DICAMBA	UG/L	153	<1.5	<1.5	2	<1.5	<1.5	13	<1.5	<1.5		
DICHLOROACETIC	UG/L	1	<1	<1				1	<1	<1		
DICHLORODIFLUOROMETHANE (FREON 12)	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	0.68		
DICHLOROMETHANE	UG/L	232	<1	<1	11	<0.5	1	62	<0.5	<0.5	5	
DIELDRIN	UG/L	153	<0.02	<0.02	2	<0.02	<0.02	--	--	--		
DIISOPROPYL ETHER	UG/L	106	<3	<3	9	<3	<3	25	<3	<3		
DIMETHOATE	UG/L	152	<11	<11	2	<0.1	<0.1	10	<10	<10		
DINOSEB	UG/L	166	<2	<2	5	<2	<2	13	<2	<2	7	
DIQUAT	UG/L	169	<4	<4	5	<4	<4	--	--	--	20	
DIURON	UG/L	36	<1	<1	--	--	--	--	--	--		
ENDOTHALL	UG/L	164	<45	<45	5	<45	<45	--	--	--	100	
ENDRIN	UG/L	166	<0.1	<0.1	5	<0.1	<0.1	--	--	--	2	
ETHYLBENZENE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	300	
ETHYLENE DIBROMIDE (EDB)	UG/L	187	<0.02	<0.02	6	<0.02	<0.02	--	--	--	0.05	

CHEMICAL NAME		**Santa Clara Subbasin**			**Coyote Subbasin**			**Llagas Subbasin**				
	Unit	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**MCL**	**SMCL**
ETHYL-TERT-BUTYL ETHER	UG/L	108	<3	<0.5	10	<3	<3	61	<3	<3		
FLUORIDE (NATURAL SOURCE)	MG/L	127	<0.5	0.74	13	0.079	0.22	31	<0.05	0.26	2	
FOAMING AGENTS (MBAS)	UG/L	87	<0.1	0.068	3	<0.1	<0.1	3	<0.05	<0.05		500
GAMMA-BHC (LINDANE), TOTAL	UG/L	166	<0.2	<0.2	5	<0.2	<0.2	--	--	--	0.2	
GLYPHOSATE	UG/L	166	<25	<25	5	<25	<25	--	--	--	700	
GROSS ALPHA	PCI/L	56	<3	9.5	1	<3	<3	3	<3	2.07	15	
GROSS ALPHA MDA95	PCI/L	55	0.343	3	--	--	--	--	--	--		
HALO ACETIC ACIDS (5) (HAA)	UG/L	1	<1	<1	--	--	--	1	<1	<1		
HARDNESS (TOTAL) AS CACO3	MG/L	125	53	7990	8	192	297	28	131	538		
HEPTACHLOR	UG/L	166	<0.01	<0.01	5	<0.01	<0.01	--	--	--	0.01	
HEPTACHLOR EPOXIDE	UG/L	166	<0.01	<0.01	5	<0.01	<0.01	--	--	--	0.01	
HEXACHLOROBENZENE	UG/L	164	<0.5	<0.5	5	<0.5	<0.5	1	<0.5	<0.5	1	
HEXACHLOROBUTADIENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
HEXACHLOROCYCLOPENTADIENE	UG/L	164	<1	<1	5	<1	<1	1	<1	<1	50	
HEXACHLOROETHANE	UG/L	--	--	--	--	--	--	5	<5	<5		
HYDROXIDE ALKALINITY	MG/L	125	<2	<2	3	<5	<5	28	<1	<1		
IRON	UG/L	151	<20	68000	12	<20	24.3	29	<20	800	0	300
ISOPROPYLBENZENE	UG/L	218	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
LANGELIER INDEX @ 60 C		52	0.2	1.2	2	0.5	0.5	3	0.25	1.3		
LEAD	UG/L	104	<5	25	10	<5	<5	30	<5	<5	15	
M,P-XYLENE	UG/L	189	<0.5	<0.5	6	<0.5	<0.5	37	<0.5	<0.5	1750	
MAGNESIUM	MG/L	124	4.2	1540	9	27.3	42.8	28	10.3	68.8		
MANGANESE	UG/L	142	<20	1530	9	<10	295	30	<20	345		50
MERCURY	UG/L	125	<1	<1	13	<1	<1	31	<1	<1	2	
METHOMYL	UG/L	149	<2	<2	2	<2	<2	--	--	--		
METHOXYCHLOR	UG/L	166	<10	<10	5	<10	<10	--	--	--	30	
METHYL ETHYL KETONE (MEK, BUTANONE)	UG/L	205	<10	<10	10	<0.5	<0.5	34	<10	<10		

CHEMICAL NAME		**Santa Clara Subbasin**			**Coyote Subbasin**			**Llagas Subbasin**				
	Unit	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**MCL**	**SMCL**
METHYL ISOBUTYL KETONE	UG/L	205	<10	<10	10	<10	<10	34	<10	<10		
METHYLENE CHLORIDE	UG/L	--	--	--	6	<0.5	<0.5					
METHYL-TERT-BUTYL-ETHER (MTBE)	UG/L	232	<3	<3	15	<3	<3	62	<3	<3	13	5
METOLACHLOR	UG/L	152	<0.55	<0.55	2	<0.05	<0.05	10	<0.5	<0.5		
METRIBUZIN	UG/L	152	<0.55	<0.55	2	<0.05	<0.05	10	<0.5	<0.5		
MOLINATE	UG/L	165	<2.2	<2.2	5	<2	<2	11	<2	<2	20	
MONOCHLOROBENZENE	UG/L	232	<0.5	<0.5	--	--	--	62	<0.5	<0.5	70	
NAPHTHALENE	UG/L	226	<1	<1	10	<1	<1	61	<1	<1		
N-BUTYLBENZENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
NICKEL	UG/L	125	<10	38	13	<10	<10	31	<10	16	100	
NITRATE (AS NO3)	MG/L	470	<2	45.8	48	<0.05	70.6	268	<0.05	171	45	
NITRATE + NITRITE (AS N)	UG/L	79	<400	7300	3	790	5500	1	2672	2672	10000	
NITRITE (AS N)	UG/L	97	<400	<400	21	<400	<400	16	<400	<400	1000	
ODOR THRESHOLD @ 60 C	TON	89	<1	2	2	1	1	3	<1	1		3
OXAMYL	UG/L	166	<20	<20	5	<20	<20	3	<20	<20	50	
OXIDATION REDUCTION POTENTIAL	mV	42	<120	339	7	192	343	44	<27	330		
OXYGEN, DISSOLVED	MG/L	8	0.2	7	1	9	9	9	0.13	11		
O-XYLENE	UG/L	189	<0.5	<0.5	6	<0.5	<0.5	37	<0.5	<0.5	1750	
PCB-1016	UG/L	127	<0.5	<0.5	2	<0.5	<0.5	--	--	--		
PCB-1221	UG/L	127	<0.5	<0.5	2	<0.5	<0.5	--	--	--		
PCB-1232	UG/L	127	<0.5	<0.5	2	<0.5	<0.5	--	--	--		
PCB-1242	UG/L	127	<0.5	<0.5	2	<0.5	<0.5	--	--	--		
PCB-1248	UG/L	127	<0.5	<0.5	2	<0.5	<0.5	--	--	--		
PCB-1254	UG/L	127	<0.5	<0.5	2	<0.5	<0.5	--	--	--		
PCB-1260	UG/L	127	<0.5	<0.5	2	<0.5	<0.5	--	--	--		
PENTACHLOROPHENOL	UG/L	166	<0.2	<0.2	5	<0.2	<0.2	13	<0.2	<0.2	1	
PERCHLORATE	UG/L	258	<4	4.4	31	<4	5.6	153	<4	7.2	6	

CHEMICAL NAME		Santa Clara Subbasin			Coyote Subbasin			Llagas Subbasin				
	Unit	Result Count	Min	Max	Result Count	Min	Max	Result Count	Min	Max	MCL	SMCL
PH, FIELD	PH	49	6.59	8.32	12	6.56	7.7	48	6.45	11.36		
PH, LABORATORY	PH	130	6.6	8.2	3	7.8	7.9	28	6.9	8.1		
PHOSPHATE, ORTHO	MG/L	1	<1.2	<1.2	--	--	--	--	--	--		
PICLORAM	UG/L	166	<1	<1	5	<1	<1	13	<1	<1	500	
P-ISOPROPYLTOLUENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
POLYCHLORINATED BIPHENYLS (TOTAL PCB'S)	UG/L	166	<0.5	<0.5	5	<0.5	<0.5	--	--	--	0.5	
POTASSIUM	MG/L	105	<2	44.6	9	0.9	2	28	<2	<2		
PROPACHLOR	UG/L	152	<0.5	<0.5	2	<0.5	<0.5	10	<0.5	<0.5		
RADIUM 226	PCI/L	1	<1	<1	--	--	--	--	--	--	3	
RADIUM 228	PCI/L	24	<1	1.09	--	--	--	7	<1	<1	2	
RADIUM 228 MDA95	PCI/L	16	0.35	1	--	--	--	--	--	--		
SEC-BUTYLBENZENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
SELENIUM	UG/L	124	<5	8.6	13	<5	<5	31	<5	14	50	
SILICA	MG/L	38	12.2	43	6	19.6	33.8	25	21.6	41.1		
SILVER	UG/L	124	<10	<10	9	<10	<10	28	<10	<5		100
SIMAZINE	UG/L	167	<4	<4	5	<1	<1	11	<1	<1	4	
SODIUM	MG/L	124	15.9	11200	9	19.2	112	29	13.4	102		
SODIUM ABSORPTION RATIO		16	1.52	3.72	--	--	--	--	--	--		
SOURCE TEMPERATURE C	C	60	14.4	27	7	17.1	22.8	48	17.8	26.5		
SPECIFIC CONDUCTANCE	US/CM	158	420	54400	24	450	1090	81	434	1350		1600
STYRENE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	100	
SULFATE	MG/L	125	<0.5	2450	9	18.9	68.8	39	6.4	106		500
TERT-AMYL-METHYL ETHER	UG/L	108	<3	<3	10	<3	<3	61	<3	<3		
TERT-BUTYL ALCOHOL	UG/L	39	<2	<2	7	<2	<2	25	<2	<2		
TERT-BUTYLBENZENE	UG/L	226	<0.5	<0.5	10	<0.5	<0.5	61	<0.5	<0.5		
TETRACHLOROETHYLENE	UG/L	232	<0.5	0.8	15	<0.5	<0.5	62	<0.5	4.2	5	
THALLIUM	UG/L	125	<1	<1	13	<1	<1	32	<1	<1	2	

CHEMICAL NAME		**Santa Clara Subbasin**			**Coyote Subbasin**			**Llagas Subbasin**				
	Unit	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**Result Count**	**Min**	**Max**	**MCL**	**SMCL**
THIOBENCARB	UG/L	165	<1	<1	5	<1	<1	11	<1	<1	70	1
TOLUENE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	150	
TOTAL DISSOLVED SOLIDS	MG/L	125	256	31600	9	274	544	29	252	736		1000
TOTAL ORGANIC CARBON (TOC)	MG/L	1	<0.3	<0.3	--	--	--	--	--	--		
TOTAL TRIHALOMETHANES	UG/L	189	<1	8	6	<1	<1	39	<4	<4	80	
TOXAPHENE	UG/L	166	<1	<1	5	<1	<1	--	--	--	3	
TRANS-1,2-DICHLOROETHYLENE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	10	
TRANS-1,3-DICHLOROPROPENE	UG/L	47	<0.5	<0.5	8	<0.5	<0.5	53	<0.5	<0.5	0.5	
TRICHLOROETHYLENE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	64	<0.5	21	5	
TRICHLOROFLUOROMETHANE (FREON 11)	UG/L	232	<5	<5	15	<5	<5	62	<5	<0.5	150	
TRIFLURALIN	UG/L	36	<1	<1	--	--	--	--	--	--		
TURBIDITY, FIELD	NTU	26	0.05	15	6	0.15	0.88	47	0.1	16.6	5	
TURBIDITY, LABORATORY	NTU	130	<0.1	230	9	0.07	0.48	29	0.05	5.4		5
URANIUM	PCI/L	1	<2	<2	--	--	--	--	--	--	20	
VANADIUM	UG/L	54	<3	10.627	6	<3	3.6	25	<3	14		
VINYL CHLORIDE	UG/L	232	<0.5	<0.5	15	<0.5	<0.5	62	<0.5	<0.5	0.5	
XYLENES (TOTAL)	UG/L	232	<1.5	<1.5	15	<1	<1	62	<1	<0.5	1750	
ZINC	UG/L	124	<50	9300	9	<50	<50	28	<50	63		5000